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CONTENTS.

Acting, doubtless, on a suggestion contained in an address delivered by the Hon. the Minister of the Interior during his recent visit to Dawson, the Yukon Council has appointed a special committee from among its members to draft a set of laws or regulations to govern mining in that territory, which after receiving the endorsation of the whole Council at a meeting to be called for the purpose in the course of the next few weeks, will be submitted to Parliament and passed as an Act of the Dominion at the next session of the House, probably without question or change. Conditions in the Yukon are now reasonably settled and understood, so that it will not be difficult for the committee to prepare regulations eminently fitted to meet the requirements of the region.

The resignation in June last of Mr. T. A. Rickard from the editorship of the *Engineering and Mining Journal* was generally regretted by the readers of that important publication, as it was feared that it further implied his permanent retirement from the field of journalistic effort. It is gratifying, therefore, to learn that this is not the case, as Mr. Rickard who, by the way does not, like the publishers of some of our engineering periodicals, regard a paper as nothing more than a lure for advertisements, has purchased and will ere long (to be exact on January 1st next), assume the editorial control of the *Mining and Scientific Press* of San Francisco, which for many years has run a good race with its competitors for a first place among the mining and engineering journals of America. There can be no doubt at all that the usefulness of the *Mining and Scientific Press* will be increased and its scope and influence widened under Mr. Rickard's editorship, and the statement can, we think, be made without disparaging the good work already accomplished during the past twenty years by the publishers of this journal. During the time Mr. Rickard was in charge of the *Engineering and Mining Journal* he ceased to practice as an engineer, and scrupulously avoided any connection with mining or promotion affairs. We are informed that the new editor of the *Mining and Scientific Press* will follow a similar line of conduct. Our friends in the West are to be congratulated upon securing so redoubtable a champion and counsellor.

The Government mine inspectors in the Cobalt district are still alive, upon which fact we extend to them heartiest congratulations. It is really fortunate (for the inspectors) that their duties do not take them to Nevada or even law-abiding British Columbia, or, indeed, anywhere but in Ontario. Thus, a correspondent writes: "On my return here I find that the Government inspector is getting in giant work, and already a very large number of claims have been thrown open for prospecting. I

understand that in nearly every case appeals are being made and there is no doubt that in many cases there will be a long and bitter fight for possession. Meantime, of course, business is blocked to a large extent owing to the fact that no titles can be reached, and no one is inclined to spend much money in the development of claims under these conditions. Of course, the opportunity of belated prospectors who have organized for the purpose of acquiring claims thus thrown open for prospecting is not being neglected, and large forces of men are now at work following up the work already done by the original discoverers in the hope of developing something valuable enough on which to hold the claims. To my mind, should they succeed in so doing, more particularly by the mere development of the vein on which an original discovery had been made, they are only doing gratuitous development for the benefit of the original discoverer. However, that of course is a matter that will have to be decided by the courts later on."

We have once or twice before mildly suggested to our estimable contemporary, the London *B. C. Review*, the desirability of making certain of the authenticity of its Canadian mining intelligence before commenting thereon. However, the *Review* has again ignored this warning, and in its issue of Sept. 9th, a most ridiculously ignorant leading article appears on the subject of the new cobalt-silver district of Coleman Township, Ontario. If our contemporary would obtain and peruse the excellent reports of the Ontario Bureau of Mines and, if we may be pardoned the egotism, if he would only read the CANADIAN MINING REVIEW, he would have known, some time ago, that the new district has not produced any two and a quarter millions of dollars "within a few months." Also we regret to advise the *B. C. Review* that the Toronto *Globe* is notorious, on this side of the water, for the inaccuracy of its statements whenever it chooses to print anything respecting mines or mining. The statement attributed to the *Globe* that "for transportation alone $200 was paid on a carload of 23 tons" may be correct, but when it makes the statement that $25 per sack of 140 lbs. have been charged for treatment it is dreaming, it is "away off," and it needs a very large dose of somebody's Fruit Salts. Finally, we regret that our contemporary has so mixed up the Hudson's Bay Company, a corporation several hundred years old, with a little one or two months old mining company, as to attribute to the big imperial Hudson's Bay Company an interest in claims in this section. We beg the *B. C. Review* to get a few geographies, encyclopaedias, Government reports and other sources of information, and to religiously dig into and absorb them before undertaking to make further editorial announcements concerning Canada and things Canadian.

It is stated that before undertaking a revision of the mining laws of the Province, the Ontario Government hopes to secure an expression of opinion from all interests directly or indirectly affected, and that consequently meetings of mining men in the chief productive centres should, it is suggested, be held with this object in view. While no harm, and possibly some good might be accomplished by the holding of meetings in the various mining sections, yet the only way by which the mining community can adequately present their wishes with some fair degree of unanimity is by calling a convention to meet at some central spot, more appropriately at the capital of the Province, at which the delegates attending would represent, not only localities, but interests and classes. If some such action as this be not taken the Government will have so much conflictory evidence to sort out and attempt to reconcile, that a wise administration would postpone indefinitely the proposed revision; while an unwise one in attempting to please all would produce a law which would satisfy none, since it would be unworkable. If the Ontario Government is, as we believe, honestly desirous of giving the Province a good mining law, it should itself take steps to encourage a meeting of representative mining men to give their views on the suggested revision. Matters, too, would be enormously facilitated and the likelihood of a speedy reconciliation of differences assisted by the attendance, which could doubtless be arranged, of expert advisers, such, for example, as Dr. Raymond, of New York, or other authorities on mining law, whose experience and advice would be invaluable. A representative convention would be productive of infinitely more satisfactory results than a commission, while it would also be a less expensive luxury.

The "Big Four" schemers, whose methods have previously been exposed by the MINING REVIEW, are again at their tricks, as witness the following paragraph from a recent issue of the Vancouver *World*:

"Riches in the rough may be seen by the passer-by in the window of the Dominion Trust Company, Hastings Street, the said riches being gold-copper ore, which would make a prospector's eyes fairly glisten. The samples shown are from the celebrated Big Four mine, situated between the Le Roi and the War Eagle, at Rossland. They have, however, travelled far since they were cut out of the strata, having been exhibited at St. Louis, where they took first prize as being the richest in the world. Naturally, the samples are attracting much attention, more especially as it is known that the mine they came from is the subject of competition between the C.P.R. and the Great Northern railway companies, both of which find that they need it in their business. The Dominion Trust Company is placing a limited number of shares on the Vancouver market."

Anent which the Rossland *Miner* remarks that it contains hardly a word of truth, and adds:—"The Big Four is not situated between the Le Roi and the War Eagle. It is also certain that the ore of the Big Four is not the richest in the world, and it is

equally certain that the Big Four ore did not take the first prize at St. Louis. It is also certain that the Canadian Pacific and the Great Northern are not competing for the ore of the Big Four, as it has not produced enough to compete for.

"If the Big Four, however, produces enough ore to make a decent shipment there is no doubt about the railway companies competing for it. It is high time that the systematic misrepresentations of the Big Four should cease. The methods followed by the Big Four are detrimental to this camp, and some means should be found to put an end to them."

We direct attention to a letter published elsewhere in this issue from Mr. W. G. Trethewey, of Cobalt. This letter is interesting in that it represents a point of view differing diametrically from that held in general by claim owners and others interested in the development of the Cobalt district, in respect to the policy adopted by the Ontario Government in withholding title to locations unless arbitrary conditions, in no wise specified by the "Regulations for Mining Divisions" or by the Mines Act, are fulfilled to the satisfaction of an official specially appointed to adjudicate thereon. While it is refreshing in this world to run across a really contented man (though Mr. Trethewey has every excuse for his present frame of mind in that he has large interests in two valuable Cobalt properties), at the same time we regret our inability to admit even his premises, much less his conclusions. In the opinion of at least a very considerable majority of the miners and prospectors in the district there is no set of circumstances which could justify the adoption of the autocratic and high-handed measures that have been pursued. At the same time our correspondent states the "Act has not been changed," but merely "enforced." Surely, here is a mis-statement at the start. The Act has not been changed, but it has been elaborated by Orders-in-Council to such an extent that it has become unrecognizable. What is the good of an Act of Parliament at all, if its very sense and provisions may be changed at the discretion of individuals in this fashion? Mr. Trethewey remarks that "under the present arrangement the original discoverer" is secured in his title!" But this, too, is quite contrary to actual fact, (see list elsewhere of claims thrown open during past month), since the prospector after staking his ground is obliged to go and ask a policeman, beg pardon, mine inspector, the riddle: "Please, sir, when is a location not a location, and need I pull up stakes?" Of course, if the inspector is good enough to pronounce that the discovery is, in his opinion, a valuable one, then the discoverer takes high rank at once, as the "real thing," the genuine, legitimate, bona fide, honest prospector, quite innocent of any blanket(ty)-ing (blank?) intentions. It is probably true, as Mr. Trethewey suggests, that "conditions at Cobalt are unique," but then anything more unique than the mining regulations it would be impossible to conceive.

The *Iron Age*, referring to the copper industry on this continent, points out that practically all the Canadian copper, and a very large part of the Mexican product, is refined and marketed in the United States, and that a considerable share of the American exports are, therefore, really Mexican or Canadian metal in transit for the world's market. Our contemporary refers to Canadian dependence upon American metallurgical works as being striking, and proceeds to say in evidence of this that, one of the large companies of the Boundary district in British Columbia has its smelting plant across the line in Washington *(sic)*, other concerns ship for future treatment either their matte or their converter bars to Puget Sound or Atlantic Coast refineries, while the greater part of the copper and nickel matte of the Sudbury district goes to the States for separation and refining. The same state of affairs exists in Mexico, the only large Mexican producer shipping direct to Europe being the Boleo, in Lower California. It is furthermore pointed out that, as the copper interests of Canada and Mexico are largely owned and controlled by American capitalists, the three countries have become practically a unit, so far as copper production is concerned. The suggestion is therefore offered that it would be more correct in presenting the statistics of United States copper exports to make allowance for these imports, and the point is illustrated by reference to the figures recently published by the Bureau of Statistics. The American exports of copper, (excluding ore, the contents of which is not known), were, for the two years ending June 30th, 1904, and June 30th, 1905, respectively, 422,595,277 lbs. and 591,362,271 lbs. of copper. The imports were, for the fiscal year ending June 30th, 1904, 175,238,869 lbs., and for 1905, 190,449,406 lbs. Of this, 108,808,940 lbs. were imported from Mexico in 1903-4, while this quantity was increased to 124,743,986 lbs. in 1904-5. For the last two years the imports from British North America have averaged nearly thirty-seven million pounds of copper. At the same time, the United States export of copper (in which this Canadian and Mexican product is included) increased last year to over four hundred million pounds, or a gain of 153,556,457 lbs. in twelve months. Our contemporary remarks that such figures throw a flood of light on the tremendous development of the copper consumption of the world and explain the steady rise in values during the past year, in spite of the great expansion in production which has been, and is still, taking place in the United States, Canada and Mexico.

THE LE ROI SQUABBLE.

As we stated in a recent issue, the Le Roi amalgamation scheme has by no means fallen through, as in view of the consolidation of the Blackstock and Canadian Pacific mining interests in British Columbia some of our readers were inclined to believe. As a matter of fact, that arrangement merely facilitates the carrying out of the more comprehensive plan, the consummation of which is now practically de-

pendent on a ratification by the shareholders of the Le Roi Company at the annual general meeting which will be held shortly in London, for no opposition is to be anticipated from the Canadian interests. The dismissal (for it amounts to that) of Mr. A. J. McMillan, the company's managing director, meanwhile implies that Mr. Waterlow has been able to convince his colleagues, including the chairman, Sir Henry Tyler, that his view of the situation is the correct one, while that of Mr. McMillan is at least prejudiced. We observe that some of the London financial papers have expressed sympathy with the late managing-director, and suggest that he has been badly used, and, more especially, as "since he took charge of the property its prospects have improved enormously." That may or may not be true, but in a mine such as the Le Roi it is not a very difficult matter to effect, by the process known as gutting to show temporarily any sort of exceptional result; moreover, some of the credit that Mr. McMillan may claim may very possibly rightly belong to the late manager, Mr. S. F. Parrish, who did a great deal more for the Le Roi than he was ever thanked for. But this is all beside the point. As we understand it the directors realize, what is undoubtedly true, that handicapped as it now is with an excessive capital, a white elephant of a smelter, and other legacies of erstwhile unwise counsels, the Le Roi cannot be placed upon an adequate profit-earning footing. It is, therefore, evident that a radical change in policy is requisite, and the amalgamation scheme appears to the majority to offer the best possible way out of the wood. Mr. McMillan has a perfect right to object if he considers it his duty to do so, and we confess, that unless his colleagues had very grave reasons for distrusting his honesty of purpose, his ejectment savours somewhat of high-handedness, and the action of the Board, except upon these premises, would not have been politic. If Mr. McMillan's opposition originates from a conscientious scruple as to the advantages that will accrue to Le Roi shareholders from a consolidation of interests as proposed, even if his judgment be at fault, one is forced to admire the principle on which he has taken so firm a stand, but there are certain matters in connection with his present attitude that require to be cleared up before his entire disinterestedness can be admitted.

ELECTRIC SMELTING OF IRON.

Elsewhere will be found a communication from a correspondent anent the newspaper booming of electric processes for steel making. In this connection, as confirmatory of our correspondent's views, we call attention to a recent paper by Mr. R. S. Hutton, appearing in the Proceedings of the Society of Chemical Industry.

Mr. Hutton presented this paper before the Manchester section of the Society, and in it he shows very clearly that the costs of electric power generation for electric lighting and traction purposes are so very different in character from the costs of the fluid when needed for electric smelting, that no definite conclusions may be drawn from figures given by lighting or traction companies, and chiefly by reason of the very intermittent character of the load, instancing that the average power station is fortunate to get a 15 per cent. load factor, whereas chemical works, using electricity for the manufacture of chemicals, have a nearly constant load factor of 100 per cent. The figures of $30.00 to $40.00 per horse-power year, are given by Mr. Hutton with the prophecy that with producer gas such figures might be reduced to $20.00 a year. The corresponding figures for power delivered by the corporations at Niagara vary from $17.00 to $21.00 per horse-power year. Mr. Hutton goes on to say there does not appear to be any immediate probability that electrical methods will be used for the reduction of metallic iron from its ores, and that the application of the electric furnace to the metallurgy of iron is largely founded on the experience gained in the manufacture of calcium carbide, designating the few small scale experiments as of more historical than technical interest. Again, Mr. Hutton makes mention of the fact that even the carbide furnaces have produced chiefly rich ferro alloys, such as ferro chromium and ferro silicon, which are exceedingly high-priced and are chiefly of service to portions of the steel industry. Mr. Hutton's opinion is that "direct competition with the blast furnace is obviously out of the question so far as all present iron-producing countries are concerned." Mr. Hutton furthermore lays stress upon the possibility of replacing about two-thirds of the present fuel used in the production of pig-iron by electric heating; as only about 33 1-3 per cent. of the coke charged is necessary for the chemical reduction of the ore, the balance is employed in producing and maintaining the requisite temperature, and it is for the maintenance of this temperature that Mr. Hutton suggests the utilization of electricity. As to the possible advantages of producing steel by electric methods the matter still remains to be examined on its own merits, and apart from any connection with ordinary processes. From the report of the Canadian Commission it was long since clear that all the operations of smelting and refining can be successfully accomplished by electricity, but it was also made sufficiently clear that wherever coal was cheap it was quite certain that much of the heating could be more economically done by the combustion of fuel than by the application of the electric arc.

VALUE OF TOPOGRAPHICAL MAPS IN GEOLOGICAL FIELD WORK.

Dr. R. A. Daly, in an introductory note to his report on the "Geology of the Western part of the International Boundary (49th Parallel)," fully endorses the argument we advanced in a recent issue on the advantage and economy of having topographic maps of a locality prepared before it is

visited for the purposes of geological investigation. Dr. Daly remarks:—

"This season is the first in which I have been supplied with topographic maps on a satisfactory scale and of sufficient accuracy for thorough geological mapping. The experience of the four years engaged in this boundary work emphasizes the futility of attempting to combine, in one field season, the topographic and geologic surveys of a mountainous region. The topographic map resulting from such a combination of forces may, indeed, be a permanent asset to the government and the people, but it is safe to say that on account of complexity of the average mountain range, the geologic map constructed along with its topographic base, is, from a *structural* point of view, necessarily very imperfect, if, indeed, it be not quite worthless. Such a geologic map cannot be considered a permanent asset. The same area must inevitably be studied again before its map can be placed among the standard geologic maps of a government survey. This conclusion does not apply to reconnaissance surveys which can never be used in the determination of detailed rock structures except in an incidental way. On the other hand, the structure and origin of the rock formations in any area form the very kernel of the truth which should be expressed in a standard geologic map issued by a government for the benefit of the people. My own experience in this agrees with that of every other Dominion geologist working in the mountains as well as with that of the many workers in the mountains of Europe, India and the United States. True economy teaches that topographic parties should precede the geologists in such regions. The geologist must have his topographic map in his hand if he is to attack with confidence the problems of rock structure, rock origin and ore genesis. A special economy of time and money resulted this season from the fact that I possessed the topographic map of the boundary belt. Through August and September smoke so obscured the country that a topographic corps must have remained idle. Triangulation was quite impossible; other branches of the work must have been almost as completely restricted in a rugged region where one could see but a few hundred yards in any direction. Nevertheless, with the Commission topographic map at my disposal I was able to map geologically in detail three hundred square miles of the belt. Without the aid of that map, half of the field season would have been lost, though the expense of the pack train and assistance were as great as during the times of active field operations."

Dr. Daly's view is also shared by Prof. Brock. who, referring to the work of the Survey in the Lardeau district of British Columbia, points out that serious delays resulted last year from the fact that the topographical and geological surveys were carried on concurrently.

THE ZINC INVESTIGATION IN BRITISH COLUMBIA.

The mining fraternity throughout Canada will, we think, join with us in protesting strongly at the treatment accorded Mr. A. C. Garde, a Canadian engineer of recognized standing, at the hands of a certain political clique, in the lead mining districts of Kootenay. Mr. Garde was appointed by Dr. Eugene Haanel to act as a member—in the capacity of assistant to Messrs. Ingalls and Argall—of the Zinc Commission in British Columbia. No sooner was this known than certain individuals with whom Mr. Garde was for reasons (not at all to his discredit) *non persona grata*, commenced an attack against him and political influences were brought to bear for his removal from the Board. This succeeded in so far that Dr. Haanel fearing, doubtless, that the usefulness of the Commission's work was in jeopardy, appointed Mr. J. L. Retallack in Mr. Garde's stead. Mr. Retallack, however, although we understand bitterly opposed to the appointment of Mr. Garde, was obliged to refuse the appointment realizing that he had not the necessary technical qualifications, and Mr. Garde was reinstated. Under these circumstances the matter would not have required notice in the REVIEW, but for the fact that the Nelson *Daily News*, probably the most influential newspaper published in the Kootenays, continues to be-cudgel Dr. Haanel for his appointment of Mr. Garde, on the ground that he has disregarded the advice and wishes of local mine-owners, "who had at the outset urged on him" the desirability of entrusting the expert work in connection with the investigation to "disinterested specialists, men of recognized ability and standing in the mining world," the inference of course being that Mr. Garde is incompetent and prejudiced. We submit that our contemporary, which is, when uninfluenced by political consideration, generally fair-minded and impartial, has no right to infer anything of the sort of an engineer of Mr. Garde's reputation and standing. To Mr. Garde the Slocan mine-operators owe a great deal;—at any rate they thought well enough of him when he was resident in the district to elect him president of their association,—for he was the first man among them all to address himself to the practical solution of the zinc problem in British Columbia, to call attention to the economical importance of the occurrences, and, if we recollect rightly, to suggest an investigation of these resources under Government direction. But in view of local jealousies, these things are now forgotten. To the unprejudiced man the appointment of Mr. Garde, who is no longer practicing professionally in British Columbia, and has no financial interest in the findings of the Commission, will appear to be an eminently suitable one, and not less so for the very reason urged against him, that he has gained by residence a special knowledge of the district in which the investigations are to be conducted, a qualification which should be of considerable service to his colleagues. If, therefore, what the *News* affirms is true that "the probable outcome of the business will

be, that the report of the Commission will be discredited in advance, while certainly its work will be seriously handicapped by the avowed determination of several of the principal mine owners to refuse Mr. Garde access to their mines,"—then either the conduct of these mine-owners is childish, or there is something more than an alleged objection to Mr. Garde to explain it. It is well to remember, however, that the zinc investigation was devised to promote and assist the development of a Canadian industry and not for the benefit of individuals, consequently no individual has any right to place obstacles in the way or restrict the scope or usefulness of the enquiry.

Since the above was written, our correspondent in British Columbia has sent us the following information:—

"The Zinc Commission is meeting with an untowardly reception in the Kootenay. There is a legitimate grievance and one that is not legitimate. In the first place, to be of much avail, the Commission ought to take in all the zinc properties and not merely the mines which have showed a large percentage of zinc ore as depth has been gained. To do this, considerably more time than that which has been allotted, which is variously stated as from two to four months, should be given to the enquiry. At a time when zinc was a distinct detriment to a mine, every prospect which showed ore containing a heavy percentge of zinc was left unworked. It was seen from the start that under the then conditions its profitable exploitation would be impossible unless the zinc would lessen its percentage as depth was gained. Unfortunately the reverse has proved to be the case, mines have rather heightened than lowered their percentage of zinc with increased depth. Now every one of these prospects is of value in the estimation of the magnitude of the zinc resources of the Kootenay. But to anything like thoroughly examine these properties it would be necessary for the Zinc Commission to extend its labours into next season, doing as much as possible this and devoting a portion of the winter for considering the problems of zinc reduction especially where chemically combined with iron. The other grievance is childish. A dead set has been made at the appointment of Mr. A. C. Garde as the local expert. It is claim that this is altogether political, but this hardly seems to be the case as the objection comes not alone from Kaslo but also from Sandon. Now the Sandon opposition would seem to originate from the Payne (on account of matters connected with details of Mr. Garde's management of which a lawsuit is pending), the Lucky Jim and another American mine, the manager of which is actively opposed to Mr. Garde, is making himself active in the opposition. This can hardly be termed political. These men have refused to allow Mr. Garde to enter their mines. But, under the constitution of the Commission, as arranged by Dr. Haanel, it is not Mr. Garde but Mr. Phillip Argall who is to examine the mines, Mr. Garde's duty is to look into the prospects. Therefore, if Mr. Argall is to be excluded from the mines of these men because they have some private cause of offence with his local colleague, such a procedure cannot be termed otherwise than childish and petulant. It is declared but not officially, nor by any responsible mining board or man that Mr. Garde is thought to be lacking in knowledge of his subject despite his institution of the first zinc concentrator in the country, but the public generally are willing enough to accept Dr. Haanel's judgment in this matter."

Therefore, it is probable, despite the reiterated petitions made to Ottawa, that this side of the controversy will be allowed to drop and the real cause of grievance, the lack of sufficient time, will urge itself more insistently upon the attention of the department.

THE TARIFF COMMISSION IN THE KOOTENAYS.

A special correspondent of the MINING REVIEW writes:—

The members of the Tariff Commission were somewhat astonished at the free trade sentiment expressed by the miners of the Boundary and of Rossland. In Nelson the representatives of the lead mining interest held opposite views. What the lead men ask is a permanent duty upon lead and its products at the expiration of the bounty system. It is also desired that the chief duty should be placed upon the production of pig lead, as, it is stated, that here the chief cost is incurred and not in the manufacture of pipe and of sheet lead from the pig. The justification for the duty was reasonably put. Lead mine owners pointed out that to develop a lead mine it was necessary to spend much time, years in fact, in development before the property could be a sure and steady shipper. This involved the expenditure of much capital. Now, capital would think twice and did think twice before investing in the lead mines of the Kootenay. There was no surety about the price of lead. It was possible that at the end of the development that it would be found that lead had dropped so much that its mining would be unprofitable. In other words, all the capital expended upon that development would be practically wasted. As long as there existed a bounty system there was no such fear. But the bounty system was only inaugurated for five years, half of which time has elapsed. Were the bounty to be counted upon to continue, then conditions would be different;—they would be more stable. And stable conditions are those to which the capitalists look for profit. The same would be the case were a permanent duty to be placed upon the import of lead. It would guarantee the Canadian market.

It was further urged that the manufacturers of paint should be more sharply looked after and compelled to place upon their paints the percentage of lead contained therein. At present the adulterators used little lead and the paint was not lasting. The manufacturers of good paint suffered because of their cheap competitors. The public were not

protected and half the farmers who wanted to paint their farm buildings or houses did not know one brand of paint from another. Were the practice of other countries followed with regard to paint adulteration the public would be protected, the adulterated brands would be driven out of the market and more lead would be used in Canadian paints. Hence there would be a larger market for Canadian lead.

The men of Rossland and the Boundary asked for no protection. They viewed the matter from an entirely different standpoint. They maintained that the machinery, steel rails, dynamite, candles purchased in Canada were of inferior quality, and hence they had to be purchased from the United States and on this account desired that the barriers be let down, placing many things on the free list and reducing the tariff in other cases. In this connection it was pointed out that British Columbia pays in proportion far more than does any other portion of Canada. That its cost of administration, owing to the configuration of the country is unavoidably higher and hence the provincial taxation was higher than would otherwise happen. Hence if there were an arrangement by which British Columbia with its sparse population had not to tax itself so heavily, i.e., by an increase of the provincial subsidy, the mines would be in a better position to pay the imposts demanded on machinery, etc., and so permit of the upbuilding of Canadian industries in the east. In other words, the granting of "better terms" to the province, would take away the chief argument of these free traders for their mines' sake.

Another argument used was that the mines of the Kootenay are paying the highest wages to their employees. Hence a large and industrious class of skilled white men, including the pick of the Northwestern States of the Union, are being attracted into the province and are building homes for themselves and thus creating a market for the rancher and farmer in the mountain valleys and lakeside alluvial. They were, therefore, in the best sense upbuilding the country. There is not a mine in the Kootenay that is employing Chinese labor, except in a stray case here and there of a Celestial cook. Partly for this, and partly for other reasons, the mine-owners of the districts referred to, objected to a duty of $2 per thousand being placed on rough lumber, protesting that this would merely mean that $2 a thousand would be added to the price of the lumber wanted for their mines for timbering, etc. Now, the lumber camps of the Kootenay, driven, they declare, by the example set by the coast mills, are employing Chinese more and more, and a case occurred in the little settlement of Salmo near Nelson, where the employment of Chinese in a local mill meant the destroying of that village. Protection is wanted for those, they maintained, who are upbuilding the country and not merely exploiting its natural wealth. And the best kind of protection the low grade copper gold mines could have was the lessening and the removal of duties as specified.

THE NEW MINISTER OF COLONIZATION, MINES AND FISHERIES FOR QUEBEC.

The Hon. J. Prévost, who recently entered the Quebec Government as Minister of Colonization, Mines and Fisheries, was born at St. Scholastique, County of Two Mountains, and educated at St. Mary's College, Montreal, and at Laval University. He was admitted to the bar in 1894, and in 1900 was elected president of the Liberal Association of the County of Terrebonne, the same year being returned to the local house as member for the district. Four years later he was re-elected by a large majority.

It is the intention of the new Minister to introduce radical amendments to the present mining laws of the province with a view to stimulating prospecting and also to render title more staple. It is greatly to be hoped in the interest of the industry in the Province of Quebec, that this programme will be carried into effect.

THE HUNTINGTON - HEBERLEIN PROCESS.

A United States Consular report states that the Sullivan smelter at Marysville, B.C., produced in July between 500 and 600 tons of bullion operating under the Huntington - Heberlein process. The first month's operations were largely experimental, but the results were exceedingly satisfactory, and the new smelting process is a success beyond question. The ore treated was exclusively from the Sullivan mine, running about 30 per cent. lead and 12 to 14 ozs. in silver. The smelter has a capacity of 100 tons daily, but the roasting apparatus is not sufficient to keep the plant running at its full capacity. It is therefore proposed to increase the roasting facilities. The Huntington-Heberlein process is said to show an advantage, in the operating cost, of about $2 per ton of ore smelted, as compared with the ordinary process.

This process is now coming into very general use, displacing the old processes of lead smelting. One of the latest installations is at Tarnowitz, Prussia, and an extremely interesting report of the plant, translated from the German, is published in the Engineering and Mining Journal of New York, of Sept. 23rd.

CHANGE OF MINING REGULATIONS IN THE YUKON.

An order-in-council has been passed providing that in future a royalty will not be required or collected on gold produced from quartz from claims upon which $25,000 has been spent on machinery, etc., within five years after the date of the order. A plant with a minimum capacity of 5 tons per day must be installed for milling or otherwise treating the ore, the value of which is to be included in the estimate of outlay. The royalty is abolished with respect to copper claims provided $50,000 is expended upon them within ten years and a smelter erected of not less than 10 tons capacity per day.

A POPULAR ENGINEER.

Mr. Chas. Fergie, whose appointment to the managership of the Dominion Coal Company we announced in a recent issue of the MINING REVIEW, was presented with an address on the occasion of his departure from Westville, by the officials of the Drummond colliery and members of the Ladysmith Lodge, P. W. A. This address reads as follows:—

"The undersigned, in behalf of the officials of the Drummond colliery and the members of Ladysmith Lodge, P. W. A., desire to embrace this opportunity of expressing our personal regard for you and our appreciation of the conciliatory and honourable way in which you have discharged your duty toward the men under your charge as well as your devoted faithfulness toward the company during the long years of your official connection with the Drummond colliery.

"In common with the citizens of Westville, generally, we have rejoiced in the vigor, professional skill, sagacity and enterprise which you have displayed, evidencing themselves in greatly enlarged outputs, expanded markets and thorough equipment of works.

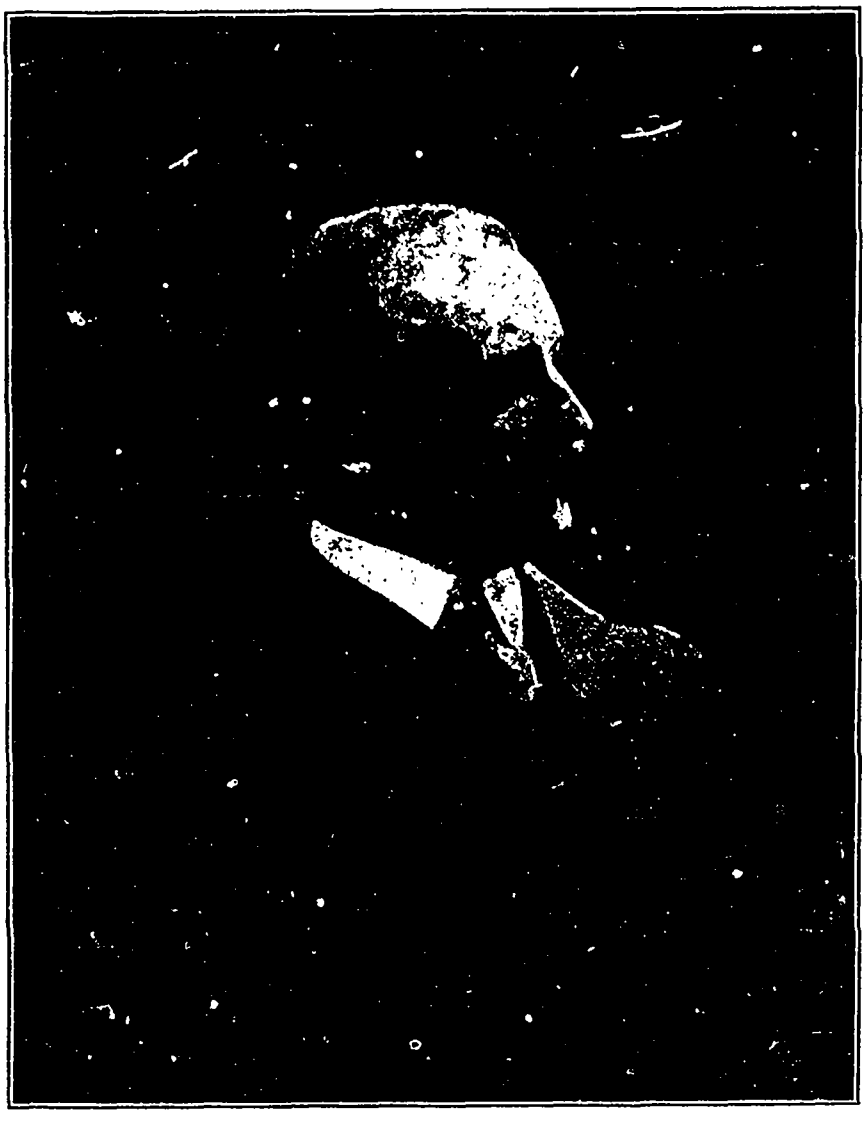
"We congratulate you on your well deserved promotion to a much larger and more responsible field and we assure you that in your new sphere we heartily wish that you may attain to a highly satisfactory and honourable success.

"In parting, we beg you to accept this cane as a memorial gift and hope you may not only find it a reminder of pleasant former associations, but also an article of present practical usefulness.

"We also beg permission to present to Mrs. Fergie this piece of silver plate as a token of our respect for a lady who has shared responsibilities with yourself at Clare Park and whose charming hospitality there and gracious influence in the community has been explicitly for good. We can always congratulate you on your good sense in having, years ago, taken as your partner in life one of the fair daughters of Canada.

"We hope that in the rising city of the east you may find generous co-operation and encouragement, and we heartily wish for yourself, Mrs. Fergie and family long life, health and happiness.

We are enabled to reproduce the accompanying excellent recent photograph of Mr. Fergie, by the kind courtesy of the Montreal *Standard*.

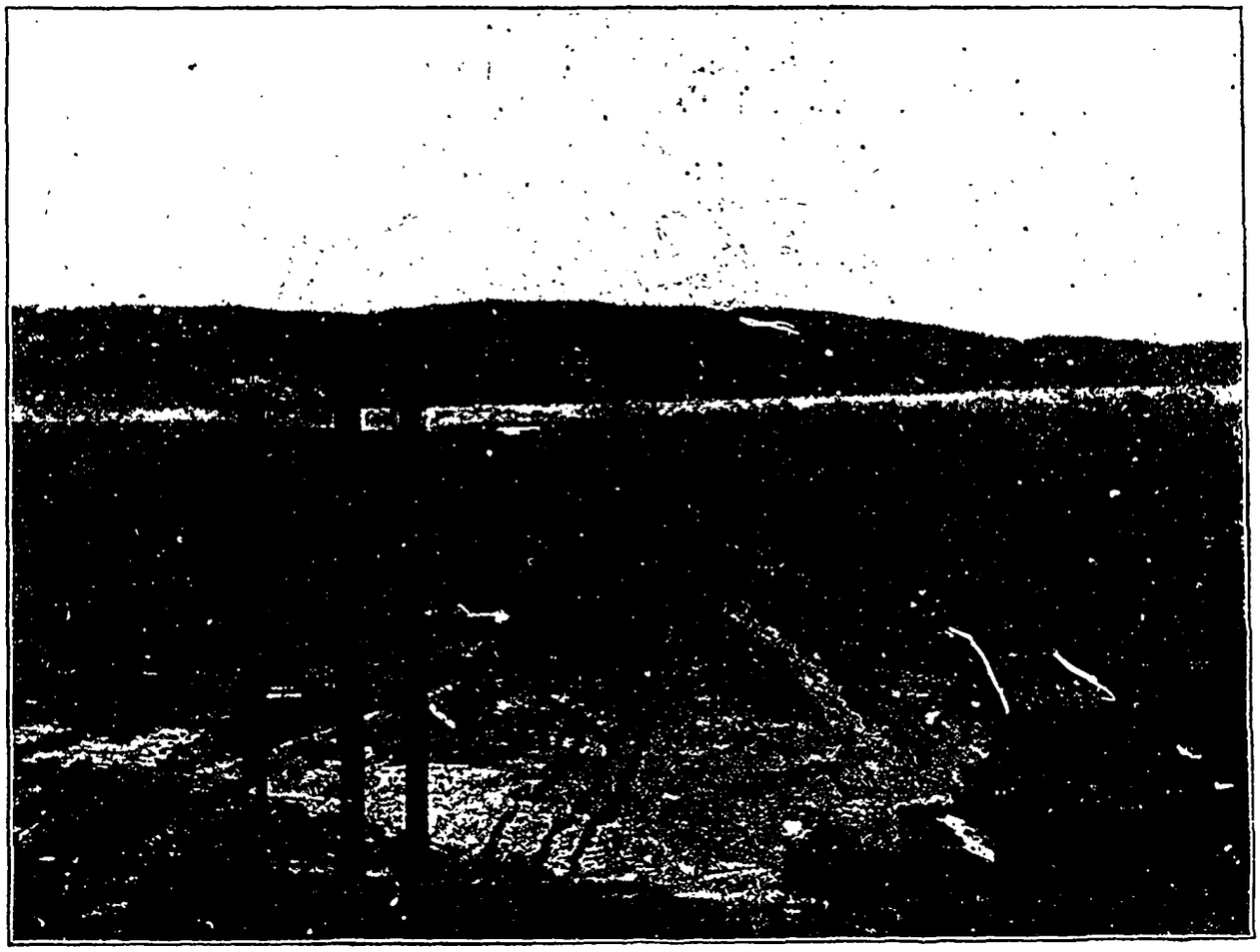


MR. CHAS. FERGIE,
New Superintendent of Mines for the Dominion Coal Co.

RECENT DEVELOPMENTS AT THE CANADA CORUNDUM COMPANY'S MILL.

(By D. G. Kerr.)

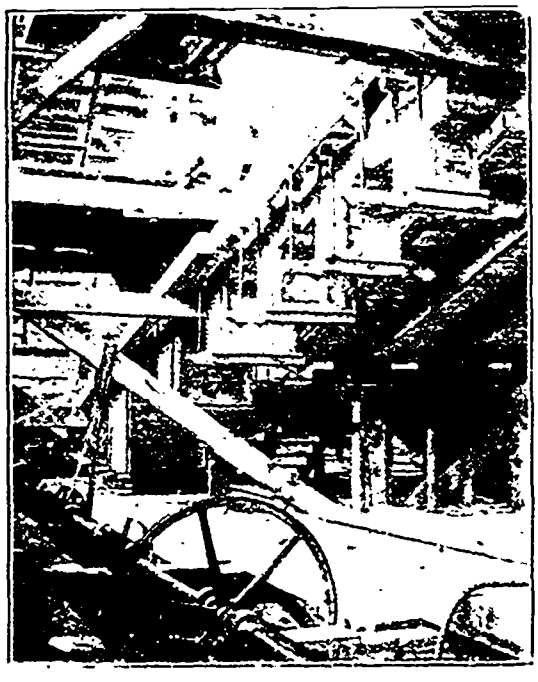
Three of Prof. Richards' hydraulic classifiers, which were recently installed at this Company's mill, are now in operation and doing excellent work on the fine sizes. The mill practice may be described as follows: The ore is conveyed from the quarries to a "coarse ore" bin, which has a capacity of 400 tons, it is conveyed from chutes (on the under side) to a 15x24 inch crusher, of the Blake type, by which it is crushed to 2 1-2 inches and



View Showing Tramway from the Mill to the Wharf.

dropped on to an 18-inch conveying belt 85 feet in length, having an elevation of 16 feet at the delivery end. The stream of coarsely crushed ore is distributed to three fine crushers, two of the Blake type having 6x24 inches jaw opening and one Gates' gyratory crusher. These three machines crush the ore to pass a 3-4 of an inch ring and under. It is then dropped into a bin of 300 tons capacity. From this fine ore bin the ore is fed to rolls by a Challenge feeder. The first set of rolls which are 40 inches in diameter and 14 inches face, run 85 revolutions to the minute. The product from these rolls goes to two trommels, which are three feet in diameter, 13 feet long, and make 20 revolutions per minute. They are covered with perforated sheet steel, the holes being 3 mm. in diameter. The undersize, or ore passing through these holes, is taken to No. 1 elevator, while the oversize goes to two sets of rolls also 14x40 inches. The pump from these rolls is elevated by No. 2 elevator and made to pass through two more trommels, of the following dimensions: 3 feet diam., 13 feet long, with 18 revolutions per minute, the perforations being 3 mm. The undersize from these trommels goes to the No. 1 elevator and the oversize to a set of 14x24 inch Gates' rolls. The crushed ore from this set of rolls is again conveyed to the No. 2 elevator, the process being continued until all the ore is finally crushed sufficiently small to pass through a 3 mm. screen. As already mentioned, the material which passes through the 3 mm. holes of both sets of trommels is taken to No. 1 elevator. This elevator lifts the fine pulp to a height of 75 feet where it is dumped into a "dividing box," in which by the introduction of water a division is made into three streams of water and pulp, which are piped to the three classifiers. These classifiers are built from the designs and plans of Prof. Richards of Boston. They consist of six boxes placed in a line, containing water pressure compartments; the first box is 10 inches wide and the last 36 inches wide. The

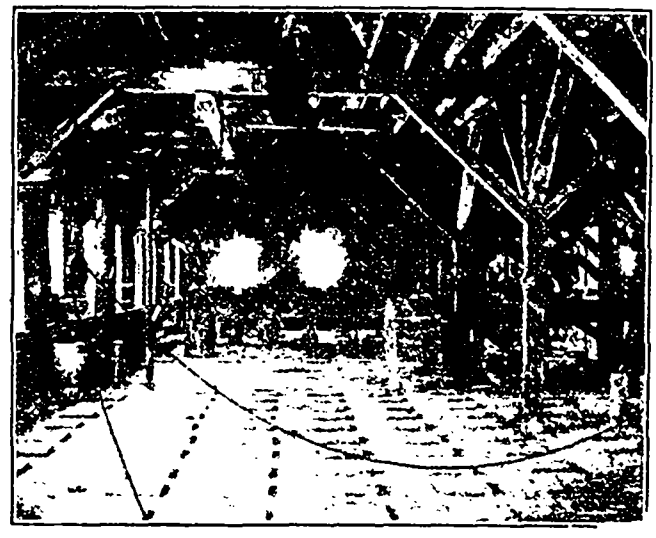
first box contains the coarsest particle and the last one (36 in. wide) the finest which will readily settle. The water which overflows from the last box goes into a settling tank. The discharge from the first spigot of the classifiers goes to 3 two compartment Hartz jigs; the discharge from the spigot goes to two Overstrom tables and one Wilfley table; the discharge from the third spigot to three Overstrom tables, while the discharges from the fourth, fifth and sixth spigots go to Overstrom tables as do also the slimes from the settling tank. The middlings from the Overstrom tables drop to the floor beneath and are treated again on Overstrom tables. The heads from the first and second jigs drop down to the roll floor and are reground by a set of 6x30 inch high-speed Colorado rolls; the heads from the coarse concentrating tables are also reground. These rolls grind the concentrates sufficiently fine to pass through a 2 mm. hole, whence they pass



View of Classifiers Designed by Prof. Richards.

to elevator No 3 and are elevated 35 feet to another trommel of 2 mm hole, the undersize dropping into storage bins while the oversize falls back into the rolls to be recrushed. There are five V-shaped storage bins, each of which have 25 tons holding capacity.

Concentration is now complete in the crushing section of the mill, and the material is taken from the grader room, by means of a conveyor belt, to a double-decked, steam-pipe dryer, where it is dried and dropped to another conveyor belt in the basement of the grader room, and conveyed to two elevators. No. 1 elevator carries up the concentrates as they come from the crushing mill, while No. 2 handles the concentrates after they have been rewashed on the Wilfley tables, while the material which is being treated on the Hooper jigs, of which there are three, also goes to the elevator. The unwashed (uncleaned) concentrates are conveyed by No. 1 elevator to the top of the building where the magnetic iron contained therein is extracted by magnetic separators. The concentrates generally



Detail of Interior Grader Building.

carry from 10 to 15 per cent. of this iron. After going through this process of magnetic separation the concentrates are carried down to the splitters and graders. The iron from the magnetic separators is meanwhile dumped outside for future treatment, as it still contains a percentage of corundum. The concentrates, having passed through the splitters and graders, go to small bins beneath the graders, and are then treated on the rewashing tables and Hooper jigs, dried, and conveyed to No. 2 elevator together with concentrates from the Hooper jigs. This product is carried over two finishing magnetic separators, again passed through the splitters and graders and falls into bins below, having been graded into twenty different sizes of from 8 to 200 mesh. It is then sacked ready for shipment.

Interior of Grader Building—A Nearer View.

The Company's power plant consists of three return tubular boilers (in a separate building), and two Corliss engines. Rope transmission is em-

ployed from the engines to the shafting, and a rope drive from the crushing mill to the grader room. A rope drive also operates a Root's pump in the basement of the grader room. This pump supplies all the water used in the mill, excepting that required for the classifiers, the latter being supplied by a duplex steam pump. The classifiers were installed during a suspension of milling operations in the spring, at which time the shafting and building were also strengthened. The Company now contemplates installing one or two additional sets of trommels, a pump and two additional magnetic separators.

Corundum Mining in Ontario—Machine Drill at Work in one of the Canada Corundum Co.'s Quarries.

THE GEOLOGICAL SURVEY OF CANADA.

Economic Work in 1904.

(Specially Contributed.)

The Summary Report of the Geological Survey of Canada for the calendar year, 1904, contains, besides thirty-eight pages of an introduction, or preliminary report, by Dr. Bell, the acting director of the survey, 392 pages of text, accompanied by maps, charts, sections, and diagrams illustrating the work of exploration and investigation carried on during the past twelve months.

The first report is that of Mr. McConnell, who carried on investigations in the Kluane area, in the south-western portion of the Yukon district. The presence of gold in this region was first made known in 1903 and a large number of streams were examined on which numerous claims were staked. Mr. McConnell writes: "The area of coarse gold discovery extends along the base of the St. Elias range for a distance of over seventy-five miles and has a maximum width of about thirty miles. Careful descriptions of the country and geological conditions and mode of occurrence of the gold, as well as indications of the auriferous streams of the St. Elias range, are described, reference being also made to the discovery of other minerals, such as lead, native copper, copper pyrites, and lignite coal. The last is stated to be "of excellent quality, burning freely in an ordinary Yukon box stove." Lignite also occurs in Kimberley Creek.

The Duncan Creek Country.

Mr. Joseph Keele was in charge of the geological survey along the Stewart River in the Yukon Territory. Though occurrences of gold had been known to Ogilvie in 1887, it was not until 1898 that prospectors made their way up the Stewart River. In 1901 a discovery was staked on Duncan Creek. Since the Klondike was made known, this is the

most important discovery made in the lower Yukon country. Hematite, scheelite, zinc-blende, copper-pyrites, stribnite, are some of the minerals associated with the gold in this region. Quartz mining promises well in some localities.

Nicola Coal Basin.

Dr. R. W. Ells then follows with his report of geological investigations in the southern interior of British Columbia, more particularly in what are now termed "the Nicola and Quilchena coal basins."

Coal had been expected in this region by Dr. Dawson, as stated in his reports of 1877-78 and 1894, respectively, and Dr. Ells has found that the possibly productive coal areas of the district could be arranged into four groups, viz.: (1) that of the Lower Nicola or Ten Mile Creek basin, about three miles below Coutlee; (2) that of the Coal Gully, containing several seams, one of which has been opened up and mined locally for some years; (3) the Coldwater seam, about a mile and a half to the east, where one seam is exposed in two outcrops on the bank of the stream, at an interval between the two exposures of nearly a fourth of a mile (these two are sometimes known as the Garesche Green area), and (4) the Quilchena Basin, which is entirely separated from the others and distant about ten miles to the east.

The length of the main coal basin of the Nicola-Coldwater area, from the foot of Nicola Lake to the south limit on the Coldwater, in a southwest direction, is about ten miles, and the greatest breadth is about three miles. The best natural section of the coal-bearing strata is seen in what is called Coal Gully, a small stream and a ravine situated about one mile and a half south of the Coldwater seam. Dr. Ells refers to two bore holes put down to test the localities, one near Coldwater and the other about two miles east on the bank of the Nicola River. One seam, three feet eight inches, was struck in the former, followed downward by two smaller seams, in all two inches thick. In the Nicola boring the seam was struck at 137 1-2 feet.

Four coal seams are displayed on Coal Gully. It was from this locality that Dr. Dawson, in 1877, obtained the section which gave alternating bands of sandstone with coal seams, the latter measuring respectively 15 ft. 4 in., 5 ft. 4 in., 3 ft. and 2 ft. 5 in. A section given by Dr. Ells from the tunnel run along the coal for 85 ft. gave: coal seam, 5 feet; shale parting, 1 ft. 6 in., and coal again, 13 ft. --in all 18 feet. of coal and a foot and a half of shale parting Dips of strata accompanying coal seams and faults were noted in the field and coal is said to appear to be of good quality, yielding large blocks, and has been mined for years for local consumption. Coal-seam No. 2 holds coal 5 ft. 3 in., shale 4 ft., and coal 4 ft.

Analyses of these coals carried on in the geological survey laboratory has shown the presence of fixed carbon in four samples to vary from 47 per cent. to 55 per cent., an average of 52 per cent. The Ten Mile Basin is then described and also boring operations in the Nicola-Coldwater Basin.

The Quilchena Coal Basin is in large part owned by the Diamond Vale Coal and Iron Mines, Ltd. The basin extends southward along the creek from Quilchena for about eight miles, with a maximum breadth of two and a half miles. The geological structure of the Nicola-Coldwater Basin also obtains in the Quilchena Basin. One seam on this property, about six feet in thickness, is recorded by Dr. Ells, whilst on the west side of Quilchena Creek a broken seam of coal with a thickness of about three feet is reported. The Tunnel or Jackson seam, about six feet in thickness, is described and elevation given with notes on the occurrence of other coal seams with various kinds of strata between. The Palmer or Camp seam, "as exposed in the Gully, there is here a thickness of about fifteen feet of coal." For surface showings, Dr. Ells describes the coal as of "good quality." Six companies are now owning mining areas in the Nicola Basin: The Nicola Coal Co., Ltd., The Coutlee Coal and Iron Co., the Nicola Coal and Iron Co., The Nicola, Kamloops and Limitkameen Coal and Railway Co. The C.P.R., (owning bases chiefly east of the Coldwater River), and the Diamond Vale Coal and Iron Mines, Ltd. Tables of bore-holes and materials struck there accompany the report.

Mr. R. A. A. Johnston gives notes on the different copper claims on which development work has commenced. On Big Sioux claim a shaft has been sunk 28 feet and a quantity of low grade ore has been raised. Aberdeen Camp and Iron Mountain areas are also described by Mr. Johnston.

Lardeau Mining District.

Professor R. W. Brock, of Queen's University, reports on his investigations in the Lardeau district, preliminary to which he made an examination of the Selkirk series of rock from Glacier to Revelstoke, along the Illecillewaet River. The character of the country along the Duncan, Lardeau and Kootenay valleys is described, including the geology of the glacier or ice-clad region, so famous for Alpine tourists and sight-seers. The geology of the solid rocks having been given, Prof. Brock deals with the mining geology and mining, giving details of the structure of the rocks and mode of occurrence of the minerals on the various claims examined within this area.

The ore of the "American" claim is described as quartz, calcite, hornblende and spattue iron, carrying galena, blende and gray copper. The "Wagner" claim, at an altitude of 8,000 feet, "on the Swede group at Poplar Creek, a considerable amount of surface work has been done, which has thrown

good deal of light on the occurrence of gold." Minute descriptions are then given of the mode of occurrence of the gold and associated minerals, which deserve careful perusal. Gold, silver, copper and blende, galena and pyrite are treated at the silver mill on the south fork of the Lardeau Creek.

Cascade and Costigan Basins.

Mr. D. B. Dowling's report on these coal basins then follows. In it he describes the work done in the Bow River Valley and the geological investigations in the Cascade Basin. The report is accompanied by a map of the district showing the extent and distribution of the coal areas in question. Estimates of the amount of coal are given, also notes on the character of the coal and its relation to geological position, the older or lower coals being the best and richest in fixed carbon. The Costigan Coal Basin is then described and characteristics of the Costigan seam indicating other seams occurring there.

Analyses of the coals collected by Mr. Dowling and others are published, showing clearly the high grade and quality of the coal.

Head Waters of the Albany River Basin.

In Mr. W. J. Wilson's report on that heretofore unexplored region lying east of Lake Nipigon along the head waters of the Little Current and Drowning Rivers, iron is reported in small quantities to the east of the Little Current River, below O'Sullivan Lake. A typical Huronian mineral bearing belt traverses this district.

The Geology of the Bruce Mines.

These mines, which have just been purchased by a British syndicate, were the subject of a special geological investigation and study last season by Mr. E. D. Ingall, Chief Engineer of the Mines section of the Geological Survey of Canada, and Mr. Theo. Denis. These two officers carried on surveys and traced out the outcrop of the various sedimentary intrusive formations, as well as roads and coast lines of lakes and rivers and prepared a final map covering "seventy square miles, which included the Bruce and Wellington group of mines." The estimated thickness of the Huronian rocks are given for this district as 18,000 feet and are represented as lying on the Laurentian, and as overlain by the Lower Silurian of the Palaeogoic. Basic intrusives whose economic importance cannot be estimated in studying such a mining region are described and were carefuly mapped and their limits defined; the limestone occurrences are also given, and the areas of diabase intrusives described. In sedimentary series, no economic deposits so far are known to occur, although, for local application, quartzites, limestones and even slates may prove to be of considerable economic value. The Wellington & Huron Copper Bay mines were exhaustively investigated, The copper occurs in the form of different sulphides, chiefly chalcocite in a gangue of quartz. A careful description of the workings and their extent is given.

Corundum in Ontario—Geological Surveys in Temagami Region.

After completing his exhaustive "Report on the Nickel and Copper Deposits of Sudbury, Ontario," Dr. Barlow devoted part of his time to preparing a report on "The occurrence of corundum in Canada," with special reference to the economic importance of this mineral. It is a noteworthy fact that the bulk of the output of corundum in the world to-day comes from Canada. The corundum mineral belongs to an "intrusive complex, the products during crystallization of a highly alkaline and aluminous magma." This merely means that the constituents of the corundum were all mixed up in the old lava and igneous masses of the earth's crust in old Archaean times, and when this crust cooled and the true crust was formed, each mineral crystallized by itself, and, to-day, the corundum crystals can be clearly seen embedded in the Syenites and gabbro of varying types. The various accessory minerals found along with corundum form a long list of species, many of which are rare, and some of economic value. Some of these may even be classed among gems or precious stones. The origin of corundum is given, showing clearly its development or a primary constituent. The chemical analyses so far prepared by Mr. M. F. Connor, prove the accuracy and application of "the law formulated by Morozewicz from his observations of the behaviour of the cooling of magnias artificially produced. The manner of production and uses of corundum are described in this report.

Cobalt-Silver District—Lake Temiskaming Northward.

Dr. Wm. A. Parks, of Toronto University, who was engaged on geological work during the summer season of 1904 in the region north of Lake Temiskaming, reports that he proceeded to Haileybury, and, inasmuch as Prof. W. G. Miller was investigating the cobalt-silver areas to the south and west, Dr. Parks made arrangements to examine the country northward to the height of land, paying particular attention to the extent of the silver-bearing series, but not neglecting the features usually dealt with in a general geological report. (As his report is of particular interest, at present, we shall present its main features in our next issue.)

Analyses of the ores show clearly the unprecedently high value of these Temiskaming ores in silver.

Minerals of the Ottawa Valley.

Mr. C. W. Arillinott has prepared a brief summary of some of the rarer occurrences of minerals in

this portion of Canada. Special attention is directed to the occurrences of lepidolite, fuchsite and translucent serpentine, the economic importance of which is not yet sufficiently appreciated in Canada.

Geology of Part of the Country of Ottawa.

Prof. Ernest Haycock, of Acadia College, Wolfville, Nova Scotia, was engaged on special work in the townships of Templeton, Wakefield and Portland, north of Ottawa. Nine types of rock masses were examined and with much difficulty mapped out owing to the variety and extent of the outcrops. Although at present the mining industry in the district is very quiet, the deposits of merchantable mica do not appear in any way exhausted. Even the old pits formerly worked for phosphate, when cleaned out, as some have recently been at Battle Lake, give very promising shows, and new ones are still being discovered. One such find, about three-fourths of a mile east of Dam Lake, in the Gore, was opened during the summer, and was showing very large crystals of excellent mica. When last visited, buildings were being erected, and other preparations made for its vigorous development. There seems no reason to doubt that, with a regular demand for the product, these rocks will continue to yield steadily for an indefinite time.

Mr. J. F. E. Johnston was also occupied in this region, visiting the township of Wakefield, Denholm, Bowman, Villeneuve and Derry, which district is practically divided into two parts by the Lieure River. Topographical features are described and the principal types of rock indicated in the different areas. Asbestos, gneisses, crystalline limestones, phosphate of lime and mica occur in the district. The last two are important. The pyroxenite rocks apparently invariably run with the phosphate bearing.

The Copper-bearing Rocks of the Sherbrooke District, Quebec.

Prof. J. A. Dresser conducted an examination of the various copper-bearing rocks of the Sherbrooke district, and made a special examination of a bog-iron deposit, near the village of Stanfold.

Certain Economic Minerals of New Brunswick.

This subject is dealt with by Prof. L. W. Bailey. Manganese deposits occur at the Falls of the Tattagouche in Gloucester, and at Dawson in Albert County. The Intercolonial Copper Company's property, near Dorchester, in Westmoreland County, was visited, and is described. The comparative scarcity of mineral fuel and the enhanced price resulting therefrom have not only proved a stimulus to the energetic working of known coal deposits, but have led to a reopening of the whole question of the productive capacity of the New Brunswick coal fields. As to actual operations, these are at present practically confined to two distinct areas, viz.: (1) that of the Grand Lake district, and (2) that of Coal Branch in Kent County.

At Dover about twenty wells have been opened, it is said, which have, in some instances, given a yield of from twenty-four barrels daily. The oil is reported to come to the surface alternately with a very strong brine, from which it naturally separates in the tanks as the result of its lower specific gravity.

The crude oil is of a dark green colour, its composition being:—

68 to 70 gravity naptha	5.5
Refined oil distillate	27
Wax distillate	37
Cylinder stocks	29.4
Loss	.008

Dolomites of high quality from the St. John Valley, used in sulphide pulp manufacture, have displaced the same material which was wont to be imported from Ohio.

Geology of the Counties of Cumberland, Hants, Kings and Annapolis, Nova Scotia.

Mr. Hugh Fletcher reports occurrences of iron ore near Grand Pré Station; magnetite on Blackwell Mount; red marl and red amygdaloid for paint near Chipman Brook. He refers to drilling operations that have been going on, revealing a nine-foot seam (it is said) north of Fullerton Lake at a depth of 2,350 feet. The report includes an account of coal in Hants County, and describes the Port Parien mines, the Broughton colliery and the Cossitt mines, Sydney. There is also a note on the Barachor's iron mine, and occurrences of materials used in the manufacture of fire-bricks and pottery are given.

Mr. Fletcher reports that coal mining in Cumberland is being vigorously prosecuted and preparations are being made for still more extensive operations at most of the mines.

Gold Fields of Nova Scotia.

Mr. E. R. Faribault of the staff has had charge of this work in the Province of Nova Scotia for many years. He is preparing a special report on the gold fields of Eastern Nova Scotia, which, it is hoped, will soon be ready for publication. A detailed survey of the gold mining district of Leipsigate in Lunenburg County was meanwhile made.

Chemistry and Mineralogy.

Dr. G. C. Hoffman's report deals with an account of analyses of fuels from various localities, of copper ore, iron, nickel and cobalt, lime, clays, mineral waters, Yukon gold, pumice stone, etc. The additions made to the collection during the year are recorded and a statement is published of the work performed by Mr. C. W. Willimott, in preparing col-

lection of minerals and rocks besides carrying out a series of experiments with ochre.

The Mines' Section.

Mr. E. D. Ingall, on behalf of the Mines' Section, in which he is ably assisted by Mr. McLeish, reports that the value of the mineral production of Canada for 1904 was $60,343,165.

The report closes with an appendix to the Mines' Section Report, by Mr. M. F. Connor of the Assay Branch of the Geological Survey, and three small appendices by Dr. Ami of the Palaeontological division, on the geological position of various strata containing organic remains from various localities in the Yukon, North West Territories and Nova Scotia.

THE ELECTRIC SMELTING OF ZINC ORES.*

By Frederick T. Snyder.

The present method of smelting on a lead basis ores containing gold and silver, consists in fusing in a blast furnace a mixture of ores containing approximately 30 per cent. silica, 20 per cent. of the oxides of iron and manganese taken together, 25 per cent of alkaline earths, 5 per cent. of sulphur, 5 per cent. of zinc and 10 per cent. of lead. A modern furnace will handle 200 tons of such a mixture per day. The product of smelting this daily charge will be about 170 tons of slag, 6 tons of matte to be re-smelted, and 19 tons of lead, the lead carrying approximately all of the gold and silver which was in the various elements of the charge.

The zinc in the charge, amounting to 10 tons per day, does not appear in the product, it having been forced into the slag and thrown away. In general, at the average smelting plant, it is a commercial requirement that the furnaces should smelt and waste as much zinc in the slag as is technically practical, the reason being that lead and precious metals can be purchased more cheaply when contained in a zinc ore than when occurring in other forms of ore. The practical limit to the amount of zinc which can be slagged off is about 10 per cent. If more zinc than this is put into the charge a portion of it will be reduced to the condition of metallic zinc, which will be volatile at the furnace temperature. This volatile metallic zinc, meeting the oxygen of the blast, is oxidized to zinc oxide. Such zinc oxide being infusible, accumulates in the furnace, clogs it up, and stops the process of smelting. If it were not for the oxygen of the blast, both metallic lead and metallic zinc would be produced at the same time. If removed from the furnace in a metallic form, the value of the zinc which might be recovered from an average furnace charge would about equal half of the lead produced at the same time, and would exceed per year the first cost of the smelting plant.

The heat needed to smelt such a charge is usually obtained by the combustion of coke inside of the furnace. A blast is forced into the furnace to furnish the oxygen required for this combustion. If this coke were burned outside the furnace, and the resulting heat separated from he gaseous products of combustion and transferred within the furnace, the volatilized zinc would not meet the blast, and escaping oxydization, might be condensed and removed in metallic form. Electricity forms a possible way of doing this. If the coke be burned under a boiler, most of the heat of its combustion will be transferred to steam. A part of the energy of this steam can be changed through the medium of a steam engine and dynamo into electricity. Almost all of the energy of this electricity can be delivered into the furnace as heat. Another way of doing it would be to burn the coke in a gas producer and use the resulting gas to drive a gas-engine dynamo combination. In such a way more of the total energy in the coke would reach the furnace.

In average modern practice, 250 pounds of coke are burned per ton of charge. Ten pounds of this coke are required chemically inside the furnace for the reduction of lead. No blast is required for the burning of this part of the coke, as the oxygen is furnished by the lead oxide. Of the balance of 240 pounds, part would be saved in burning the fuel outside the furnace. To burn this amount of carbon inside the furnace requires the introduction of 2,700 pounds of air. To heat this air from an average atmospheric temperature to 400 degrees F., at which gases escape from the furnace top, requires the combustion of 19 pounds of coke as burned inside the furnace. When coke is burned inside a furnace, the combustion is not complete, and the gases as they issue at the top carry off an amount of chemical energy per ton of charge equivalent to the combustion of 76 pounds of coke under present conditions. If these losses be deducted there remains 145 pounds of coke whose heat of combustion would have to be put into the furnace electrically to enable a furnace to run on the present basis without blast.

Under conditions of good average modern practice, 70 per cent. of the heat in fuel burned under a boiler will be transferred into steam; 17 per cent. of the heat energy in the steam could become mechanical energy in a steam engine, and 90 per cent. of this engine power can be delivered from a dynamo as electricity. Of the energy of this electricity, 90 per cent. will become heat again inside the furnace. As the total of this cycle, some 10 per cent. of the heat energy of the fuel would be delivered into the furnace, freed from all gaseous products of combustion. If a gas producer and gas engine dynamo system be used, some 15 per cent.

* Trans. C.M.I., March, 1905.

of the total heat in the fuel will reach the inside of the furnace. With such a gas producer, gas engine dynamo plant there would have to be consumed in the gas producer 970 pounds of fuel to put into the furnace electrically the same amount of heat that would be obtained by burning 240 pounds of coke inside the furnace by means of a blast. The fuel used in such a gas producer might be bituminous coal or wood. In practice some 45 pounds of fuel are consumed, per ton of charge smelted, in producing the blast; this fuel might be applied to the production of electricity, leaving 925 pounds of fuel to be supplied in place of the 240 pounds of coke, if the furnace was to be run without blast and produce the present products.

If the zinc is to be condensed and saved, in whole or in part, other heat items are involved. Under present conditions, the zinc, per ton of charge, carries into the slag, in the form of zinc oxide, the sensible heat equivalent of 11 pounds of fuel. To reduce this zinc oxide to metallic zinc would absorb an amount of heat equal to the complete combustion of 16 pounds of fuel. This metallic zinc would be volatile at the furnace temperature. If it were all removed and condensed, it would carry away with it the possible heat of combustion of 3 pounds of fuel. The reduction of the 100 pounds of zinc in a ton of charge would produce 43 pounds of carbon monoxide. The carbon monoxide from the zinc would carry away as sensible heat the equivalent of burning 2 pounds of fuel. As a net result, to save the zinc in such a way would require in addition the combustion energy of 10 pounds of fuel for each 100 pounds of zinc. When zinc is saved in this way there is required a further amount of heat to replace the potential energy carried out of the furnace by the carbon monoxide from the reduction of the lead, as CO_2 could not be formed. This would be equal to the heat energy of about 3 pounds of fuel for each 200 pounds of lead in the charge.

If two-thirds of the zinc in a standard charge were saved, the extra heat requirement per ton of charge would be the total heat of combustion of 10 pounds of fuel, and this might be obtained electrically by burning 67 pounds of fuel in a gas producer. Adding these additional fuel requirements to the 925 pounds of fuel required to eliminate the blast from the present process, makes a total of 992 pounds of bituminous coal that would be required in place of 240 pounds of coke to recover 66 pounds of metallic zinc. If the original charge had contained 20 per cent. of zinc and 10 per cent. of lead there would be required in the gas producer 1,120 pounds of bituminous coal to recover 260 pounds of zinc, and at least 240 pounds of coke of the present process would be eliminated.

If water power is available, the gas producer and gas engine might be replaced by a water-wheel. With a well designed installation, under average conditions, there might be realized in mechanical power on the water-wheel 75 per cent. of the power of the water. Of the mechanical energy, 90 per cent. would be delivered by the dynamo as electricity, and 90 per cent. of the energy of this electricity would become heat in the furnace. Saving 66 pounds of zinc from a ton of charge carrying 5 per cent. of zinc would require 1,429 horse-power hours in the water, or 650 kilowatt hours of electricity delivered in the furnace. Saving 260 pounds of zinc from a ton of charge carrying 20 per cent. of zinc would require 1,607 horse-power hours in the water, or 731 kilowatt hours of electricity delivered in the furnace.

On the basis of the rating of the water-wheels, the 5 per cent. charge would require a plant of 45 horse-power for each ton of charge capacity per 24 hours. The 20 per cent. charge would require water-wheel capacity of 50 horse-power per ton of charge smelted per 24 hours. On the basis of the rating of engine output, the steam or gas plant capacity required would be practically of the same horse-power as the water-wheels. In each of these cases, the 240 pounds of coke and 45 pounds of coal used in the present process would be eliminated.

CALCULATIONS.

Heat Carried Out of Furnace by Blast.

400 F.....Temp. gases from furnace.
70 F.....Temp. atmospheric air.

Specific heat air constant pressure = .24
Heat per pound air = (400 — 70) .24 = 79.2 B.T.U.
200 ton per day furnace requires 5,000 cu. ft. air per minute.

$$\text{Lbs. of air per ton ore smelted} = \frac{5000\times60\times24\times75}{200\times1000} = 2700$$

$$\text{B. T. U. per ton ore smelted} = 2700 \times 79.2 = 213{,}800 \text{ B.T.U.}$$

$$\text{B. T. U. per lb. coke (2-3 } CO_2 \text{ \& 1-3 CO)} = \frac{214{,}200}{3} + \frac{4200}{3} = 10{,}900$$

$$\text{Pounds coke per ton ore smelted} = \frac{213{,}800}{10{,}900} = 19.6$$

Chemical Energy Lost in Furnace Gases.

Burning to 2-3 CO_2 and 1-3 CO in place of 3-3 CO_2.
Heat given out in burning 1 lb.
C to CO_2 ..... = 14,200 B.T.U.
Heat given out in burning 1 lb.
C to CO ..... = 4,200 B.T.U.
Heat lost per lb. C by incomplete combustion ..... = 10,000 B.T.U.

Heat lost per ton ore smelted.. $= \frac{250}{3} \times 10{,}000$
$= 830{,}000$ B.T.U.

Coke equivalent .... $= \frac{830{,}000}{10{,}900} = 76.1$

Steam Engine Efficiency.

42 B.T.U. per min. = 1 H. P.
18 B.T.U. per min. in each lb., 150 lbs. steam per hour
Average practice, 14 pounds

Pounds steam per h.p. hour $= \frac{42}{18} = 2.33 = 100$ p.c. efficiency.

Average practice efficiency.... $= \frac{2.33}{14} = 16.7$ p.c.

With 12 pounds efficiency.... $= \frac{2.33}{12} = 19.4$ p.c.

Mechanical efficiency engine..... = 85 p.c.
Total efficiency at 12 lbs. = 85 × 19.4 = 16.5 p.c.
Total efficiency at 14 lbs. = 85 × 16.7 = 14.2 p.c.

Gas Engine Efficiency.

1 ton coal ..... = 30,000,000 B.T.U.
1 pound coal ..... = 15,000 B.T.U.
1 h.p. hour ..... = 2,545 B.T.U.

Theoretical efficiency ..... $= \frac{2{,}545}{15{,}000} = 17$ p.c.

Net efficiency heat .... = 17 × .90 × .90 = 13.77
Possible gas engine efficiency ..... = 26 p.c.
Possible producer efficiency ..... = 85 p.c.
Possible power .. = 85 × 26 × 85 = 18.8 p.c.
Electric power .. = 18.8 × 90 × 90 = 15.2 p.c.

Fuel Required to Produce Blast.

5000 cubic feet per minute for 200 tons per day,
48 oz. = 3 pounds pressure of air.

Ft. lbs. $= \frac{\frac{P_1 .29}{P_2 - 1}}{.4} P_2 V_2$ Where P_2 is in lbs. per sq. ft. + V_2 in cu. ft.

H.P. per cu. ft. free air per min. to 3 lbs. = .025

Cubic feet per ton ore.. $= \frac{5000 \times 60 \times 24}{200} = 36{,}000$

H.P. hour per ton ore smelted $= \frac{36{,}000 \times 25}{60 \times 1000} = 15$

Cost horse-power hour .... $= \frac{3600}{360 \times 24} = \$.0042$
Cost per ton ore smelted.. = .0042 × 15 = \$.063
Pounds coal per ton ore ... = 15 × 3 = 45

Sensible Heat in Furnace Gases.

Weight of blast per ton ore..... = 2,700 lbs.
Weight of coke per ton ore..... = 250 lbs.
Weight of oxygen in lead..... = 16 lbs.

Total gases from furnace ..... = 2,966 lbs.
Sensible heat ..... = 2,966 × 79.2
= 235,000 B.T.U.

Heat in Lead from Furnace.

Temperature of lead = 1,000 degrees F.
Weight of lead .... = 190 pounds
Sp. heat of lead .... = .04 for fluid lead
Heat fusion lead.... = 24 B.T.U. per pound
Sp. heat ..... = (1,000—100) .04 = 36 B.T.U.
Heat fusion ..... = 24

Total heat .... = 60 B.T.U.
Heat taken out by
lead, per ton.... = 60 × 190 = 11,400 B.T.U.
200 lbs. lead per ton smelted.
190 lbs. lead. per ton saved.

Heat Radiated from Furnace.

Water required in water jackets—
Temp. at entering jacket.... = 60 degrees F.
Temp. at leaving jacket..... = 200 degrees F.
For furnace, 200 tons required = 20 gals. per min.
167 lbs. per min.
Water required for jackets per ton charge =

$\frac{167 \times 60 \times 24}{200} = 1{,}202$ pounds

Heat absorbed = (200—60) 1,200 = 168,000 B.T.U.
Other radiation, 25 per cent..... 42,000

210,000 B.T.U.

Campbell shows 5 per cent. total heat in fuel radiated from iron blast furnace—
5 per cent. of fuel of lead furnace. = 178,000 B.T.U.

Heat in Slag.

Total heat per ton ore ..... = 250 lbs. coke = 3,560,000 B.T.U.
Sensible heat carried off by furnace gases ..... = 235,000 B.T.U.

Chemical potential heat in furnace gases ..... = 830,000
Heat in metallic lead ..... = 11,400
Heat radiated from furnace ..... = 210,000

Total heat other than in slag..... 1,286,400 B.T.U.

Heat in 1,750 pounds of slag ..... 2,293,600 B.T.U.

Heat per pound of slag ..... 1,300 B.T.U.

Heat fusion slag = 600 B.T.U.

$$\text{Specific heat slag...} = \frac{1300 - 600}{2190 - 70} = \frac{700}{2120} = 0.33$$

Heat Carried to Slag by Zn.

$Zn + O = ZnO$
$65 + 16 = 81$

$$100 \text{ pounds Zn} = \frac{81 \times 100 \text{ ZnO}}{65} = 124.6 \text{ lbs. ZnO}$$

Heat = 1,300 × 124.6 = 162,000 B.T.U.

$$\text{Pounds fuel} = \frac{162{,}000}{14{,}200} = 11.4$$

Heat to Reduce ZnO to Zn.

Heat per pound Zn = 2,360 B.T.U.
Per ton charge .... = 100 × 2,360 = 236,000 B.T.U.

$$\text{Equivalent fuel ...} = \frac{236{,}000}{14{,}200} = 16.6 \text{ pounds}$$

Heat Carried Out by Zinc.

Temperature of escaping Zn..... = 2,000 deg. F.
Temperature of ore charge ..... = 70 deg. F.
Specific heat Zn (2,000 to 100 F.).. = .08
Sp heat per lb. Zn = (2,000—70) .08 = 155 B.T.U.
Heat vaporization per lb. Zn..... = 200 "
Latent heat fusion per lb. Zn..... = 112 "

Total heat per lb. Zn..... 467 "
Heat for 100 lbs Zn = 46,700 B.T.U.

$$= \frac{46{,}700}{14{,}200} \text{ lbs. fuel}$$

$$= 3.3$$

Heat in CO from Zn.

$Zn + C = Zn + CO$
$81 \quad 12 \quad 65 \quad 28$
Sp. heat per lb. CO.. = (2,000 — 70 .23
= 444 B.T.U.

$$\text{Sp. heat per lb. Zinc} = \frac{448 \times 28}{65} = 192 \text{ B.T.U.}$$

Sp. heat per ton charge = 192 × 100 = 19,200 B.T.U.

$$\text{Fuel required} = \frac{19{,}200}{14{,}200} \text{ lbs.}$$

$$= 1.4 \text{ lbs.}$$

Heat Lost in CO from Lead Reduction.

$$\text{Pounds of carbon per lb lead} = \frac{12}{206} = .058$$

$3{,}300 \times .058 = 193$ B.T.U.

Pounds of carbon per ton ore ..... = .058 × 200
= 11.6
Energy from CO_2.... = 14,200 per lb. C.

$$\text{Energy from (2-3 } CO_2 \text{ \& 1-3 CO)....} = -\frac{2}{3}(14{,}200) \times -\frac{1}{3}(4{,}200) = 10{,}900$$

Loss per pound C.. = 3,300 B.T.U.
Loss per pound lead = 3,300 × .058 = 193 B.T.U.
Loss per ton ore.... = 193, × 200 = 38,600 B.T.U.

$$\text{Fuel equivalent .....} = \frac{38{,}600}{14{,}200} = 2.72 \text{ lbs.}$$

20 Per Cent. Zinc in Charge.

20 per cent. Zn = 400 lbs. per ton charge.
2-3 of 400 = 267 lbs. of Zinc saved.

$$\text{Fuel} = \frac{267}{100} \times 10 + 3 = 26.7 + 3 = 29.7 \text{ lbs.}$$

$$\text{Would require in gas producer} \frac{29.7 \times 100}{15} = 197 \text{ lbs.}$$

Total required = 925 + 197 = 1,122 lbs.

Electricity Required.

145 pounds C to run present process.
5 per cent. Zn.

$$(16 - 11 + 3 + 2) \times \frac{2}{3} + 3 = 10 \text{ pounds C.}$$

Total energy = (145 + 10) 14,200 = 2,210,000 B.T.U.

$$\text{Kilowatt hours} = \frac{2{,}210{,}000}{3{,}412} = 650 \text{ K.W.H.}$$

20 per cent. Zn.

$$(16 - 11 + 3 + 2)\frac{4 \times 2}{3} + 3 = 29.7 \text{ pounds.}$$

Total energy = (145 + 29.7) 14,200 = 2,490,000 B.T.U.

$$\text{Kilowatt hours} = \frac{2{,}490{,}000}{3{,}412} = 731 \text{ K.W.H.}$$

Empirical formula for charge with 10 per cent. Pb.
K.W. hours = 623 + 5.4 percentage of zinc in charge.

Water Power Required.

Water-wheel efficiency ..... = 75 per cent.
Dynamo efficiency ..... = 90 per cent.
Line efficiency ..... = 90 per cent.
Net efficiency = 75 × 90 × 90 = 60.8 per cent.
With 5 per cent. Zn.

$$\text{H.P. hours} = \frac{650}{.746 \times .61} = 1429$$

With 20 per cent. Zn.

$$\text{H.P. hours} = \frac{731}{.746 \times .61} = 1607$$

$$\text{H.P. plant (5 p.c. charge)} = \frac{1429 \times .72}{24} = 44.7 \text{ H.P.}$$

$$\text{H.P. plant.(20 p.c. charge)} = \frac{1607 \times .75}{24} = 50.2 \text{ H.P.}$$

Engine Capacity Required.

Line efficiency ..... = 90 per cent.
Dynamo efficiency ..... = 90 per cent.
Combined efficiency ..... = 81 per cent.
Engine capacity

$$\text{(5 per cent. basis)} = \frac{650}{.746 \times .87 \times 24} = 44.7 \text{ H.P.}$$

Engine capacity

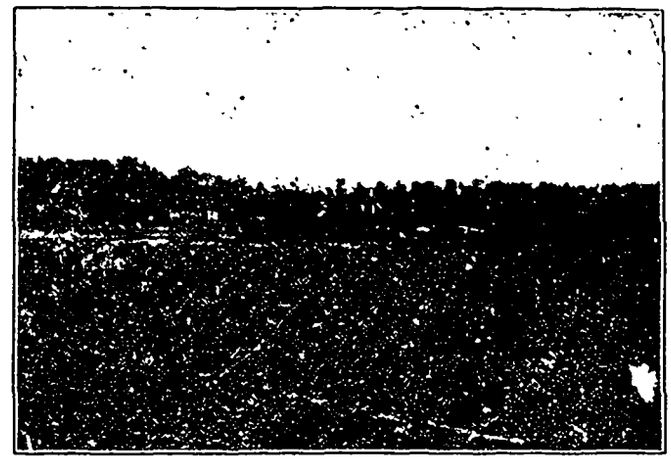
$$\text{(20 per cent. basis)} = \frac{731}{.746 \times .81 \times 24} = 50.2 \text{ H.P.}$$

A NOVA SCOTIA COLLIERY.

(By Our Special Commissioner.)

The old Londonderry Iron Company, Ltd., now liquidated, had amongst its other assets the Chignecto colliery at Maccan, Nova Scotia, which, about two years ago, was bought by Senator Mitchell of Drummondville and his associates. Under the corporate name of the "Maritime Coal & Railway Company, Limited," the property was re-opened and reorganized. Many years ago the first opening on the seams was made by Mr. James Baird, chairman of the Board of Examiners for the Province of Nova Scotia, who has been retained by the company, and the care and supervision of the property still remains in his competent hands. The property has now been developed to an extent which enables it to rank among the important producers of coal in the Province of Nova Scotia, although the huge production of the Cape Breton collieries, for many years now, has completely shadowed the production of the main land mines in the province.

The Maritime C. & R. Co. own, under lease, an area of four square miles of coal-bearing lands, but as the form of this area is somewhat irregular, being taken chiefly along the outcrop of the seams, there are slightly over five linear miles of the outcrop within the four square miles. The area extends southerly for a distance sufficient to give a length of slope of over 5,000 feet on the dip of the seams. It has recently been calculated that within its boundaries this corporation has a total quantity of over 20,000,000 tons of coal of which at least 12,000,000 tons are recoverable.

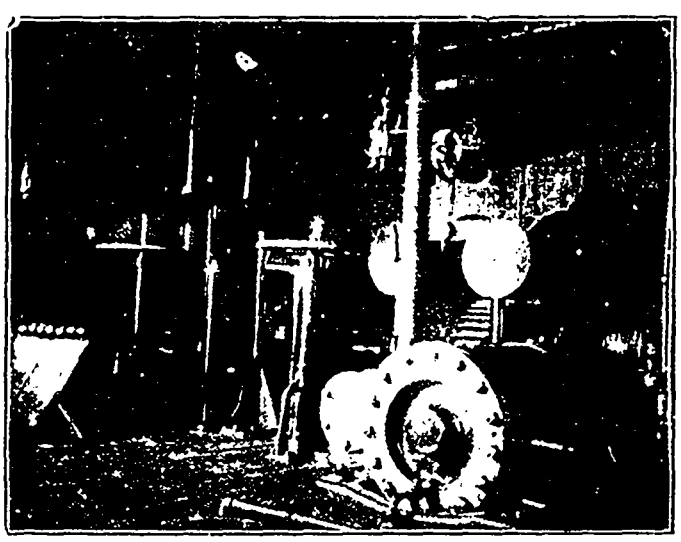


The Workmen's Cottages.

In the Post Office directory the colliery is known as Chignecto P. O., and the town is about two miles east-northeast of Maccan, a station in Cumberland County on the Intercolonial Railway. The company has built a branch line of standard gauge, about two and a half miles in length, which connects the colliery with the main line of the Intercolonial Railway at Maccan Station. The property is, therefore, advantageously situated in respect to local points of consumption, being eight miles from Amherst, 56 miles from Moncton and 68 miles from Truro. The Maritime C. & R. Co. also owns 2,200 acres of freehold land, and has set aside a portion as a town site upon which a fair-sized settlement has already sprung up. One of our illustrations shows the character of the workmen's houses which have been erected for the employees. At present 55 of these dwelling houses are occupied, and, in addition, there are two large boarding houses which provide accommodation for single men; all of these tenements are of neat design and are a credit to the company. Some of the employees have built houses for themselves upon land apart from the freehold owned by

the company. It is, perhaps, worthy of note that the class of labour employed at this colliery is unusually good, being much above the average found in the coal regions of Pennsylvania or Vancouver Island.

At the present time the output of the mine is in the neighbourhood of three hundred tons a day—a remarkably good showing when it is remembered that, at the time of the foreclosure proceedings on the property of the Londonderry Iron Co., Ltd., the greatest depth attained by the slope was about 600 feet, and that most of the coal had been mined from the rooms which had been opened. On re-opening the property it was found that it would be quite unsafe to attempt to utilize the old workings; Mr. Baird, therefore, showed his habitual acumen and good mining sense by sealing up the old workings from the main shaft and the air course, both of which were retimbered and carried down to the present depth of 1,400 feet. At 1,000 feet in the shaft the first level was turned off both to the east and the west, and it now has an aggregate length of



The Engine Room.

2,700 feet. At the bottom of the shaft (1,400 feet) a similar level was also turned off on both sides and to the same distances from the shaft; both the 1,000 and the 1,400 feet levels are connected with parallel air courses by the usual slants, making a first class circulation of air. Although the mine makes a small quantity of gas the air circulation is so good, and the gas is so thoroughly swept out, that naked lights are used throughout the workings.

From both levels balances have been driven to the rise at intervals of about 400 feet, from which entries have been made and rooms laid off, so that at the present time the faces available for winning coal are numerous, and a large output could now be obtained from the mine in a very short time. The superintendent appears to have desired to reserve his coal rather than to have made a large output, and there are, doubtless, several good business reasons for this policy. At the present time the property is in excellent shape to supply a large demand should such demand occur. The quality of the coal is excellent and has improved greatly with the increased depth that has been obtained. A recent analysis gives the following figures:—

	Per cent.
Water	49
Volatile combustible matter	41.61
Fixed carbon	46.29
Sulphur	4.76
Ash	6.85
Total	100.00

which shows the coal to be a true bituminous, and, from the high percentage of volatile matter, would justify a presumption that the coal might be used for gas making purposes, but it has never been tested for that purpose.

Within the area owned by the company there are three distinct beds of coal. The first one, or top seam, has a thickness of about two feet and is of excellent quality, being low in both sulphur and ash, but by reason of its thinness and the fact that it is separated from the middle and bottom seams by a bed of sandstone of great thickness it has only been opened in a few places and is not being worked. At the eastern end of the area this sandstone is quite thin, being only about four feet in thickness, but towards the western end its width has increased until it measures from fifty to sixty feet; the coal is bright and hard.

The middle and bottom seams lie close together and are separated by a band of claystone which is usually from three to five feet thick and which has, nowhere as yet, exceeded eight feet in thickness. Like the sandstone parting forming the floor of the top seam this claystone is thinnest at the eastern end and thickens going westerly. The middle seam has a general average thickness of about four feet, the bottom seam averages fully five feet and in many places on the 1,000 foot level it shows over six feet of good coal. Below the bottom seam is a hard white sandstone or close grit which makes an admirable floor; it does not swell on weathering and forms a hard footing for the props. The bottom seam is the main commercial seam, producing in its lower portion a large, black, heavy, compact coal of excellent fibre, which stands up well without making much slack when cut and screened. The middle fifteen to twenty inches is a softer coal, having a duller lustre and a shorter fibre, and also a slightly different chemical composition, the percentage of ash being somewhat increased over that of the bottom coal. Above this band of softer coal there are two feet of good, black, lustrous coal, which in places is penetrated for short distances by small ribs of stone a quarter of an inch or so thick, but these ribs are not continuous and in many rooms the coal is entirely without them.

The roof of the middle seam is good; locally, it is called a "soapstone," but there is no magnesia in the rock, which is really an argillaceous sandstone or hard gritty clay bed and should, more properly, be called a claystone. The roof breaks in blocks, and does not shale off nor does it swell and buckle with absorbed moisture; in consequence the props

used are much smaller in diameter than in many other of the coal mines in the district and the cost of working is consequently somewhat less.

The strike of these coal beds is, as is quite usual in all coal seams, somewhat irregular, but the general average direction is south 72° East. The pitch of the seams also varies, ranging from 34° at the eastern end to 60° at the western boundary; the pitch of the slope is exactly 38° to the south-south-east. Numerous readings taken on the floor of the bottom seam showed but little variation, the extremes being 38° to 42°. In this section of Cumberland County faults are numerous in other well known properties, but the whole length of the coal bed on the Maritime property has shown no faulting, the only break found being one small "hitch" of about ten inches, which is found on the 1,400 foot level, but which completely disappears four hundred feet above on the 1,000 foot level.

The coal makes a strong, solid coke, which does not crush under a heavy burden and which, therefore, would make a valuable metallurgical fuel but for the high amount of sulphur contained. The results of a sample carload (which was properly washed) showed, however, that this sulphur could be readily taken out, the coke from the washed coal yielding less than one per cent. of sulphur; a good washing plant would enable the Maritime company to enter the ranks of the coke producers. The specific gravity of the coal is 1.37.

That the mine is remarkably free from gas has already been noted and this fact is, perhaps, the more remarkable when it is known that the fan (which is an intake) is only fourteen feet in diameter and the air pressure maintained, usually, one inch of water. The capacity of the fan at forty revolutions per minute is given as 32,000 cubic feet of air.

The mine makes but a very small amount of

View of Bankhead and Fan House, Chignecto Colliery.

The coal stands handling without making much slack, since the total percentage reported as made by mining, loading, tramming, handling, picking, and delivery to the shipping cars is less than twenty per cent. It also stands banking well, experience having shown that when banked for four or five months on the surface there has been very little weathering and a very small percentage lost as slack, nor does the quality appear to be affected. The main deficiency of the plant, as it stands at present, is in the existing screening plant which has not the capacity to handle and grade all the coal which could very easily be mined; it is, however, the intention of the management to remedy this deficiency at once and to make such bankhead arrangements as will enable the mine to output from six to seven hundred tons a day, properly screen it, and grade it into the desired sizes.

water, most of which is caught above the 1,000 foot level, but although the 1,400 foot level is so dry the non-friability of the coal, which has already been mentioned when speaking of the slack made, gives very little dust so that extraordinary precautions against dust explosions are unnecessary. Hose connections, however, are placed at intervals along the water column so that a supply of water can be obtained for sprinkling whenever needed.

The good character of the roof and the consequent light timbering needed has already been mentioned, the props run from four to six inches in diameter at the top end and are usually from seven to nine feet long. All the timber needed in the mine and all the lumber required for building purposes is cut from the freehold property owned by the company; for this purpose there is a complete saw-mill, which is only run when required. The bankhead is

shown in the accompanying photograph of a train which is being loaded with coal at the screening building. Of these there are two, each of which is equipped with an incline shaking screen and with sectional, moving, iron picking tables. The picking tables are of ample capacity for an output of five hundred tons in ten hours, but the screens make but one separation of the coal into round coal and culm, as they have but the one mesh which is one inch square; to make nut coal therefore requires a second screening which is done by hand labour. This deficiency could be very readily made up through the introduction of graded screens similar to those used in certain portions of Pennsylvania.

There are no provisions at the mine for bunkerage or the storage of the screened coal against a shortage of cars, such as occurred last winter at the time of the snow blockade. When no storage is provided the colliery operations have to stop through inability to get rid of the coal after it is hoisted. The Maritime Coal & R'y. Co. is capitalized at $2,000,000 and is officered by the Hon. William Mitchell as president, with Mr. David Mitchell as managing director. Only $100,000 worth of bonds has been issued, so that the company at the present time is in an excellent financial condition. It has a ready market for its output and has realized very satisfactory prices for the coal sold. Wherever the coal has been used it has given great satisfaction for steaming purposes and is constantly in demand by factories.

The property is located in a charming bit of rolling farm country almost within sight of the tidal waters of the Bay of Fundy. The supply of water is excellent and the conditions for health of the best. The general appearance of Chignecto Village indicates prosperity and comfort and, as the prevailing winds fortunately take away from the village the dust and grime usually found about a colliery, it is somewhat surprising to notice the freshness of the verdure and the clean appearance of the gardens. Such properties as the Chignecto colliery make for a continuous tide of prosperity to the labouring classes on the main land of Nova Scotia, and the excellent administration so far has been proof against the labour troubles so common to coal mines; at the present time the company has over two hundred men on its pay sheets.

ON THE EXAMINATION AND VALUATION OF MINES.*

By John E. Hardman, S.B., Ma.E., etc.

(Continued from August issue, 1905.)

Measurement of Quantity or Tonnage.

The engineer has next before him the determination of quantities, or the problems of measuring and tonnage.

It is generally accepted that the accuracy of calculations made upon ore bodies of large size is subject to a variable factor of safety, and the matter of being "large" has to be governed by one's knowledge of the deposit, by its regularity, its development, and the experience of the examining engineer.

If an engineer of experience can measure and sample the four sides of a rectangular mass of ore, he can form an estimate, not absolutely accurate, but sufficiently so for commercial purposes, of the quantity of ore contained in that mass; in some cases he may be able to do so if only three, or perhaps even two, sides are seen; but in each of these cases a factor of safety must be employed, which will vary with the size of the block, and will be subject to an allowance covering errors arising from pinching of the width, from inclusions of waste rock, and from the presence of more or less oxidized zones which may occur within such a block. And therefore, the factor of safety, or allowance to be made, will depend first upon the size of the block, and, secondly, upon the character of the deposit, and in all cases must be determined for each deposit or block examined.

Mr. Arthur Winslow has aptly said that the amount of evidence to be required when estimating tonnage, and the classes into which such tonnage should be divided, must depend upon the general conclusions of the engineer as to the nature and general permanence of the ore bodies under consideration. There are deposits in Clear Creek County, Colorado,* where the distribution of values is so even that a block measuring 300 feet by 100 feet can safely be assumed as homogeneous, yet in the same county there is an old mine whose irregularity of values was so great that a block of one-tenth the above area could not be safely calculated as being of a *certain* value.

Some clients desire the fullest presentation of all the facts, undertaking to form a conclusion independent of the engineer's, but upon his facts as presented; other clients are unable, or unwilling to do this, and prefer a summary of the engineer's conclusions. It has been the writer's practice to give the essence, or a summary of his conclusions. in a short space of a page or two at the beginning of the report, followed by an extended and detailed statement of all the facts as collected in the examination, and of the calculations and deductions which have been made from the facts obtained.

The engineer should require from a mine which has a small amount of lateral development, and which presents only small stoped areas, a smaller size for the blocks of positive ore than he would from a mine that has been wel opened up, and that can show large stoped areas where values have been reasonably uniform in grade.

It is the exception to find an ore deposit with

* Trans. Can. Soc. of C. E.

* Stanley Mine, Idaho Springs; Two Sisters, Dumont.

regular outlines and well defined areas of pay ore; the usual circumstances disclose irregular areas with poor definition, irregular outlines and of very variable character. Some auriferous quartz veins of this country, both east and west, carry the precious metal in pretty sharply defined *pay streaks* which, however, have very irregular outlines, and may leave vey large portions of any rectangular area of the deposit so poor in value as to be *commercially* barren. This is a prominent characteristic of Nova Scotia and Ontario gold veins. The nickeliferous pyrrhotites of the Sudbury region, while usually presenting irregular outlines and consequently indefinite areas, yet compensate by comparatively sharp lines between ore and waste; in this respect they differ markedly from the British Columbia pyrrhotites, which, as a rule, present no defined sharp boundaries either of pay ore or of mineralization, the "walls" being determined (as in the Le Roi Mine) in the assay office by the shrinking of values below the figures of possible profit. This is a necessary consequence of the character of the deposits, which are metasomatic, the replacement of portions of the eruptive country by the pyrrhotite proceeding in completeness from the centre outwards, or from the plane of the shear on both sides. The longitudinal and vertical limits of the pay ore of these deposits are sometimes more sharply defined than the lateral boundary, but, speaking broadly, their boundaries are not physical, but are a matter of values.

Almost without exception ore deposits are not only irregular in form and outline, but are irregular in value as well; the well-known Homestake and Alaska Treadwell deposits occasionally produce specimens of coarse gold, although the general tenor of these properties is remarkably low grade. The same diversity in contents is seen in the amygdaloid and conglomerate copper bearing belts of Michigan, Wisconsin and Isle Royale, as well as in the so-called "mass" copper properties.

By reason of these variations in value, shape and size, the examining engineer must, for each case, decide the boundaries as closely as possible, and plot the same upon his plans and sections.* Having thus plotted the boundaries of payable ore as accurately as possible, the engineer now has to calculate the area of pay ore within each block of positive and probable ore. It should be, and is, unnecessary to say that "possible" ore has no connection with the estimation of tonnage; only ore which is "ready to be broken" can enter into measurements. The possible ore, or future possibilities of a mine must be dealt with separately, and, by preference, should be discussed only at the very end of the engineer's report. The technical ignorance of shareholders or directors may otherwise ascribe blame to the examining engineer of which he is wholly innocent.

The different areas of pay ore having been measured, their conversion into volumes follows. In most cases determination of the third dimension for each area is not difficult, the average of all the widths measured being taken. But there are deposits frequent in those of the "fissure vein" type, where the irregularity in widths observed throughout any extensive area, is so great in magnitude as to vitiate a general averaging of the widths measured. In such an event the engineer must have recourse to the resources of mathematics, and I may refer the reader, on this particular point, to the method of "revolved areas" as one which usually solves the difficulty of obtaining a correct third dimension from which to obtain the volume.

From the volumes which have been correctly calculated, the conversion is made into tonnage. Sometimes this conversion is made by using the weights per cubic foot, or Specific Gravities, which are found in the tables accompanying text books or engineers' reference books. Protest must be entered against this practice; the specific gravities given in such tables are obtained from pure, clean, selected specimens of the individual minerals, and the weights per cubic foot are calculated from such specific gravities. Now, in nature, one does not often meet with such clean, pure ores; there is always an admixture of other minerals; there are also frequently open or barren spaces arising from crevices and vugs; there are extensive density, such as dykes, horses, etc., which vitiate calculations made from such tabulated figures. It is better for the engineer to determine the average specific gravity of the ore himself on each examination, using for the purpose those portions of the assay samples which were rejected when quartering down, or the samples which were used in making sorting tests of the ores. For himself, in examinations requiring great accuracy, and in which large amounts are involved, the writer chooses to determine the specific gravity of each different class of ore, if such be met with in the mine. For an example, the Stanley Mine (in Colorado), is an aggregation of many claims including several veins of different mineralization; the area owned lies on both sides of Clear Creek, and the main vein which carries auriferous copper pyrites on the east end of the property has its chief values in silver-bearing galena on the west end, with mixed values in the centre. In this instance three different specific gravities were taken, one to be used for the vein mass on the east, one for the vein mass in the centre, and one for the vein mass in the west end.

As to the correction to be made for crevices, oxidations, vugs, etc., above referred to, it must be determined for each deposit, according to the observations made by the engineer during his examination.

* See admirable article by E. B. Kirby, *Engineering and Mining Journal*, March, 1895.

As a general statement, such correction will be found to vary from six per cent. or seven per cent. for the *veins* of the North American Cordillera, to twenty per cent. or twenty-five per cent. for some of the bedded oxidized ores of Arizona and portions of the Southern States.

The tonnage having been obtained for each block of ore, both "positive" and "probable," and the average value of each block having been ascertained by sampling and assaying, the total gross value is readily obtained. But it remains to observe a caution which is, only too frequently, disregarded. The writer refers to the tendency of the inexperienced or ignorant to use the simple arithmetical mean or average of the assays made. Due correction or allowance must always be made for the comparative quantities in weights of the samples cut, representing the varying widths of the ore sampled. Mr. Rickard uses the phrase "geometrical mean" to designate the correct average obtained by making allowance for varying widths or "weight." This geometrical mean is the figure obtained by taking the sum of the products resulting from multiplying each width of the vein (where sampled) by its assay value, and dividing this sum by the sum of the widths in feet. The product of an assay in ounces by the width in feet is known as "foot-ounces;" in South Africa Mr. Denny and others take the width in inches, and call the product "assay inches." It matters not which name is used, but what *does* matter is that the width and the assay value must be considered together, if a width of one foot assays $10.00 per ton, and a width of five feet assays $2.00 per ton, and another width of two feet assays $6.00 per ton, the true assay average, or assay per foot of width, is $4.00 and not $6.00.

The student interested is referred to a paper by Mr. G. A. Denny in the Institution of Mining and Metallurgy, and to Mr. T. A. Rickard's article before cited.

At the beginning of this paper the writer mentioned three questions as embodying the gist of what is required to be known as a result of a mine examination, and the last question was—"What additional amount of ore not measurable, is reasonably probable?" Such ore is now by common practice placed in the category of "Possible ore." The answer to this question, to have any close approximation to the truth, must depend upon the circumstances of each case and upon the personal equation of the engineer. The geology of the deposit and surrounding country, and the strong common-sense of the engineer, are the guiding factors. If the vein is traceable for some hundreds of feet on the surface, one may be justified in assuming its continuance for another hundred feet that cannot be seen; if the deposit has been worked to a depth of 700 or 800 feet, with continuing characteristics, an additional depth of 100 feet may be predicted, but if it has been worked to, say, only 100 feet in depth, it would not be common sense to assume its continuance to indefinite depths.

The testimony that is obtainable in the mine that is under examination, together with such other credible testimony as can be obtained from other and deeper mines of similar character in the same district, are the only facts available; the engineer, with these facts, and with the geological structure of the deposit before him, must deduce his conclusions. If he be experienced and has the capacity in him, he may make a successful prognostication but there are no *rules* for him or for others.

The strain of a careful examination is exhausting to the engineer, and his clients are not always heedful of the fact. They are usually impatient, and not infrequently parsimonious. But most engineers, having the pride of their profession, will not stint their work in consequence. Sampling, though always important if well and carefully done, is not in all cases the most important feature of an examination; there are engineers who do not *always* make a close sampling before submitting an accurate report.* Often the geology of the district, and the evidence obtainable from adjacent properties are of equal or greater value. If known, the characteristics of the region in which the deposit is located will often supply the data by which the evidence collected in an examination may be judged. As examples, the limitations of the pay-shoots in Nova Scotia gold veins, the persistence of the deposit without notable "bonanza" in the Black Hills region, the gradation from free gold to gold-bearing sulphurets in the Nelson district of British Columbia, may be taken.

(To be continued.)

GOVERNMENT BY ORDER-IN-COUNCIL IN ONTARIO.

To the Editor,—

Sir:—It is safe to say that such an aggravating, distracting and even ridiculous state of things as now obtains in the Cobalt district has never before been seen in any mining camp in this world. Our Minister of Lands and Mines advertises in the REVIEW and other papers, inviting prospectors to come to Northern Ontario to try their luck, and says among other things, "The mining laws of Ontario are liberal, and the prices of mineral lands low. Title by freehold or lease, on working conditions for seven years. There are no royalties."

This little paragraph sounds very well, but on the only mineral belt in the whole province, where there is any active interest in mining this year what do we find? Here is a true picture of the extraordinary condition of matters in that new and inter-

* See letter of Geo. J. Bancroft, *Engineering and Mining Journal*, February, 1903.

esting camp, as taken from a letter I have received to-day from an old prospector there in his own plain words:—

"From a mining point of view, everything is in the worst possible state here. Not that the mines are at fault, but owing to the impractical changes in the Government regulations made by orders-in-council. It leaves every prospector in doubt as to whether he has any rights or not, and no man knows where he stands. The Government refuses title to any claim until it passes inspection, and very few claims pass. Everyone is afraid to spend money on his claim because he does not know whether it is his or not. Then no man will buy a claim, nor do anything until he gets a title and a title he can't get unless he has a developed or proved up mine. A "prospect" is nowhere, no matter how promising it may be. There are only fourteen properties, old and new, that have shipping ore in sight, but over seven hundred prospectors' licenses have been sold already this year at $10.00 each or double the fee charged in British Columbia and even in the Yukon now. Besides, a man has to pay $10.00 extra for every claim he takes up after the first one, and also $5.00 for transferring a claim or any interest in i

"The result of the whole muddle and uncertainty as to titles is that the few real capitalists who visited the district have left in disgust. They did not want to invest in law suits, or the chance of titles being passed by inspectors who have no practical knowledge of mining, and who have thrown open again nearly half of all the claims in the townships of Coleman and Bucke, or the entire mineral belt. But for a wonder, twenty days are given to appeal to the Minister of Mines. All the claims that have been thrown open are being protested by the parties who took them up, and who intend in many cases to test the matter, in the courts before giving up their claims. Of course, if a man has a shipping mine he is all right anyway, but the inspection of claims has knocked out everything else, and no one wants to buy now, though there was a lively demand for even more prospects until this novel obstruction was inflicted upon us.

"The worst thing of all, perhaps, is that a prospector's oath about the discovery of mineral on a claim is not taken here any more. We have heard a good deal about the "Ross Bible," but the present government of Ontario seems to have discarded even the Hebrew Bible in this district, though such a thing has never been heard of before for over nineteen hundred years in any Christian land."

Truly, the Whitney Government has made a bad start as far as mining is concerned, and it is to be hoped that no more ignorant experiments will be tried on the silver-cobalt belt.

Yours faithfully,

A. McCHARLES.

Sudbury, Sept. 20th, 1905.

To the Editor:

Sir,—Regarding the administration of mining lands in the Temiskaming district, the writer is heartily in accord with the steps the Ontario Government have taken to prevent the country being blanketed and gobbled up by speculators and boomsters. If such action had not been taken it is safe to say that by the first day of May last there would not have been a vacant piece of land within ten miles of Cobalt, and the country would have been practically sealed to the legitimate prospector. In the action taken, the Act has not been changed, but has merely been enforced; and where an imaginary hardship has been done to one, good has resulted to many, which I think is the object in view.

Under the present arrangement the original discoverer gets his find conserved to him. What more can he ask?

Three parties have been continually in the field since early spring prospecting for the writer, but so far no post has been planted, for the reason that no finds have been made.

The conditions at Cobalt are unique, and perhaps it is the first time in our country's history that a necessity has arisen for the rigid enforcement of the Mining Act; and I am pleased to see that the Government has been equal to the occasion. There is little doubt but that in the wake of Cobalt's wonderful production of silver, and the intense interest created, numerous wildcat schemes will be sprung on the innocent public, and many will fall victims, but if the requirements in regard to "discovery of mineral in place" had not been insisted upon, Cobalt would have become a hotbed of schemers and stock boomers, and this would not have been in the public interests.

Apart from the fact that it might be advantageous to this Province, if the Government would encourage the local treatment of its ores, I am not at present prepared to discuss the proposed revision of the Mines Act.

In conclusion, I wish to say that the inspectors who have been entrusted with the very disagreeable and thankless task of enforcing the Act, are above suspicion, and the Department has in them honest and faithful servants.

Yours faithfully,

W. G. TRETHEWEY.

Cobalt, Ont., Oct. 2nd, 1905.

ELECTRIC SMELTING AND NEWSPAPER OPTIMISM.

To the Editor:

Sir,—During the last month (September) a number of papers throughout Canada, but chiefly in Western Canada, have contained articles predicting the greatness of Canada in the comparatively small space of a decade in a metallurgical way. And the particular metal whose metallurgy is to be thus expanded into an ornament of the Dominion is iron. The fact that almost all the newspapers con-

taining these optimistic writings allude to the presence of Dr. Heroult, in Ottawa, or Toronto, and that the bulk of them have also emanated from the Ottawa correspondents of the various big dailies, suggests that perhaps somewhere in among the cinders, or back of the woodpile, there is lurking an Ethiopian gentleman. The Toronto *Globe* and the western papers which cull largely from its columns, have contained interviews with Dr. Heroult and from him have extracted a voluminous mass of words, out of which appear one or two facts. The principal fact is that the first corporation on this side of the Atlantic to obtain a license from Dr. Heroult to use his process for the refining of steel has been the Holcomb Steel Company, of Syracuse, N.Y., which is credited with the laudable intention of investing one million of dollars in a plant whose output will range from 80 to 100 tons of metal a day, this metal consisting of tool steel and wire rod billets.

The papers go on to say an awful lot of balderdash and rubbish respecting the conversion of pig iron costing $20.00 a ton into a steel worth $200.00 a ton, for the insignificant sum of $1.00. It will be remembered that just about twelve months ago there appeared and was distributed to favored individuals an excellent monograph on the electric smelting of iron ores and the making of steel, which was the report of the Commission sent to Europe by the Canadian Government in December, 1903, to report upon and investigate the different electrothermic processes employed in the smelting of iron ores and the making of different classes of steel. This monograph on its appearance was unquestionably the most authoritative, complete and reliable compilation of all known data on the subject of the smelting of iron ores into iron and steel products by means of electricity. Various and competent iron and steel authorities, then, as previously, while expressing their admiration of the work which had been done on the Continent, still declined to consider electric smelting as any important factor in the immediate future of the iron or steel trade, and chiefly because of the difficulty of obtaining electric current at a sufficiently low cost to permit the commercial production of iron and steel thus made. In your own columns, early in the year of 1903, an editorial showed quite clearly that the road was not by any means smooth, and that the question of cost would undoubtedly operate to continue coke products as the principal commercial products in the field.

These various newspaper squibs and items have seemed to the subscriber to be quite in line with the ill-judged and optimistic statements about the wealth of British Columbia which were in vogue in Toronto newspapers during the five years from 1895 to 1900, and the *Globe's* correspondent strengthens this view when he talks such absolute rot and rubbish as is contained in one of his recent articles where he says that "the interior of Canada possesses no fuel, and the cost of transportation of the same to the iron fields of Central Canada is practically prohibitive." He goes on further to speak of the "immense deposits" of magnetite existing in Ontario and Quebec. These "immense deposits of magnetite," so-called, are unknown to the press, that is to say, the authentic press, as diligent search of the volumes of the Canadian Geological Survey, and of the different provincial government reports has failed to discover even ordinary deposits of workable magnetite, but the item is mentioned simply as testimony to my hypothesis that all these articles appear to have for their ultimate aim the arousing of public sentiment in favor of electric smelting.

It is interesting to note that the *Globe* correspondent says that Dr. Heroult is *reasonably* certain that pig iron and high grade steel can be produced in Canada, but although he is "reasonably certain," in order to make himself *absolutely* certain he is going to conduct a series of metallurgical experiments for six months at Sault Ste. Marie in a plant which the Canadian Government is kind enough to erect for that purpose at an ultimate cost of something over $15,000. But the correspondent shows his woeful ignorance of his subject when he proceeds to quote Dr. Heroult still further. The learned doctor is reported as saying that Canada now spends between $50,000,000 and $60,000,000 abroad in buying steel, and that the idea should be to make all that steel at home out of Canadian material by the means of Canadian water-power from Canadian labour. Manifestly, the bulk of these fifty to sixty millions of dollars, in fact over 90 per cent. is spent for the purchase of steel rails and structural steel. But if it is to cost one million dollars for a plant with a maximum output of 100 tons daily, I, for one, am of the opinion that capital for the manufacture of iron and steel by electricity will be slow in offering itself to any promoters of such a business. Can you not suggest through your columns to your readers that these puffs of new processes should undergo the test of time in this country before irresponsible newspaper writers attempt to make capital out of them. There are many things which Canada needs, and needs badly, far worse than she needs high grade tool steel and wire rod billets.

With apologies for the length of my letter, I am,

Yours truly,

HARD SENSE.

PROPOSED REVISION OF ONTARIO MINING LAW.

To the Editor:—

Sir,—As I understand that the mining laws of Ontario are shortly to be submitted to the Legislature for revision, and that the views of mining men are invited, I should like to refer you to my paper read at the Toronto meeting of the Canadian Mining Institute, in March, 1904, dealing with the subject of mining laws in Canada. My main contentions are:

(1) That a strict working condition should be required of all locators of mineral areas, while unworked land should be taxed to the utmost limit. This, to my mind, is the simplest way to prevent

the tying up of mineral lands and to promote the development of the mineral resources of the Province.

(2) No royalty should be required by the Government. The product of the mine should not, in this respect, be differentiated from the product of the soil, or of the factory; for why should the miner be placed in a less favorable position than the farmer or the manufacturer? The imposition of royalties on mineral constitutes a remnant of barbaric custom, when all mines were owned by the sovereign.

(3) The methods followed in British Columbia, in the Yukon, and in other countries, requiring the locator of mineral land to immediately record the same with the Government agent of the district, has been found to work admirably, and might be adopted to advantage in Ontario.

Yours faithfully,

EUGENE COSTE.

Toronto, Ont.

OUR LONDON LETTER.

(From Our Own Correspondent.)

Like a bolt from the blue came the intelligence that Mr. A. J. McMillan had been ejected from the directorate of the Le Roi by his fellow-directors, Sir Henry Tyler, Mr. G. S. Waterlow, and Mr. F. W. Rolt—a new comer. The announcement was made by Mr. McMillan himself in a communication to the press, which in view of its importance is enclosed herewith in case you may have room to publish it for the benefit of your readers. In his statements Mr. McMillan dealt with the developments which had led to his forcible retirement. Subsequently, he followed this up by a lengthy circular letter to the shareholders in which he criticised the position generally, explained his opposition to the amalgamation scheme, and his consequent differences with his colleagues. You will quite understand that these developments have caused a sensation here. In the absence of fuller details, it is impossible to arrive at a decision as to the merits of the points at issue, but the press on the whole has shown a tendency to take Mr. McMillan's side and to denounce the hasty manner in which the directors have acted in removing him from the board. Whether the explanation furnished by the board on Saturday last in the form of a "memorandum" will alienate support from Mr. McMillan remains to be seen. Certainly the cleavage between the late Managing Director and the Board as at present constituted, is pronounced, and the easiest way out of the difficulty will be to call the shareholders together, and let them decide the questions involved. Mr. McMillan can be left to prepare his own defence to the counter-statements made by the Board, and we are looking forward to a lively meeting next month, for, in view of their promise in the circular just issued, they cannot very well postpone it beyond that time. One of the remarkable things in connection with the Le Roi is the steady advance which has lately taken place in the price, which has been as high as £1 10s (say $7.50), the highest point reached for a long time past. This movement, mysterious in itself, is no doubt largely due to extensive purchases in preparation for the coming fight for Le Roi, for if all I hear be true about the amalgamation proposals, these in their present form will mean the transfer of the balance of power to your side. However, it is idle to speculate upon this point, as the Board will probably hurry up their report and a full statement of affairs, and then we shall see what they have succeeded in achieving. Altogether it is a pretty kettle of fish, and not likely to increase public confidence in a market already sufficiently discredited.

Recently there has been something of a recovery in Tyee Copper shares, and another feature was the sharp spurt in Ymirs which, from being practically unsaleable two or three weeks ago at a few pence, have, on the publication of unexpectedly favorable developments, jumped to several shillings. Apart from these incidents, the market remains dull, although in many directions the opinion is confidently expressed that we have seen the worst, and that from now onwards we may look for a general and welcome recovery in all departments. Money may cause occasional tremors, but the political outlook is comparatively clear, for no one believes that the Moroccan business nor the Austro-Hungarian trouble will be allowed to come to a head. Four wars in ten years—not to mention trifling "Military Expeditions" for punitive purposes—have satiated East and West, and we are now anticipating a lengthy period of peace, during which the wastage caused by these conflicts may be made good.

THE DISMISSAL OF A LE ROI DIRECTOR.

The secretary of the Le Roi Company has forwarded the following statement to the B. C. Review, of London:—

"Mr. E. Jewell, on leaving England for many months for the Argentine Republic, resigned his position as a director; Mr. F. W. Rolt has been elected to a seat on the board. Mr. A. J. McMillan is no longer managing director, and has ceased to be a director. Messrs. Bradley and Mackenzie have been requested to take charge of the mine pending arrangements for amalgamation, which will shortly be considered at meetings of the Canadian companies in Canada before being submitted to the shareholders of this company in England. Mr. Mackenzie will reach Rossland about the middle of the present month.

Mr. A. J. McMillan has published the following correspondence which explains itself:—

Salisbury House, London Wall,
London, E.C., August 28th.

Dear Sir Henry,—With reference to your request at the last board meeting that I should resign my position as a director of the Le Roi Mining Company, and that I should let you know my decision by the time the next board meeting is held, I wish to say that I cannot see my way to comply with your request.

At a time when the affairs of the company were in a desperate condition the shareholders of the Le Roi placed me on the board to look after their interests. During the time I have been a director—notwithstanding that many difficulties have been placed in my way—I have done my utmost to improve the position of the company's affairs, and this has been particularly the case for twelve months past, during which period I have for the first time been personally responsible for the management in British Columbia. The financial year just closed—at June 30th last—was one of the most successful in the history of the company—a year during which large profits were earned—and the Le Roi is to-day in a better position, financially and otherwise, than it has been for years past, probably better than it has ever been.

You tell me that my presence at board meetings is not agreeable, owing to the fact that the directors wish to discuss and proceed with amalgamation proposals which I do not approve, and you therefore suggest that I should resign my seat on the board. Believing as I do that the policy you and Mr. Waterlow are pursuing in regard to amalgamation, if persisted in, can end only in disaster to the Le Roi, I cannot consent voluntarily to resign the trust committed to my care by the shareholders, whose interests need protecting to-day more than at any time since I have been connected with the company.

In taking this position I am, of course, aware that if the directors wish to eject me from the board they have power to do so under the articles of association, and that without reference to the views and wishes of the shareholders.

(Signed) A. J. McMillan.

Sir Henry Tyler,
Chairman Le Roi Mining Co., Limited,
London, E.C.

LE ROI MINING COMPANY, LIMITED.

539b, Salisbury House,
London, Wall,
London, E.C.

To A. J. McMillan, Esq.

Pursuant to Article 108 (f), we, the undersigned, being all the other directors of Le Roi Mining Company, Limited, hereby request you to resign your office of director of the said company.

Dated this Thirtieth day of August, 1905.

H. W. TYLER,
GEO. S. WATERLOW,
F. W. ROLT,
Directors, Le Roi Mining Co., Limited.

The Board has meanwhile replied to Mr. McMillan's circular in the following "memorandum," dated Sept. 23:

At the general meeting on the 31st January, 1905, the shareholders of the Le Roi Mining Company agreed to the principle of amalgamation with other companies, after that question had been referred to at considerable length; and much time and labour has since been devoted to it.

The progress that has been made is, so far, satisfactory in the interests of the Le Roi Company, and the directors hope to be in a position to lay before the shareholders, at a meeting to be called, probably, in the coming month of October, a complete scheme, which cannot fail to meet with their approval, and to place them in the position of receiving regular dividends in the future.

But this scheme is in direct conflict with two interests (1) the personal interest of Mr. McMillan; (2) the interest of the Great Northern Railway, a powerful American Railway company carrying traffic between the Le Roi Mine in Canada and the Northport Smelter in the United States. These two interests appear—at all events as it would seem to the Board—to be jointly and actively working against the true interests of the Le Roi Company; and hence the circular addressed by Mr. McMillan to the shareholders on the 18th September, and his active exertions in obtaining, through the press in Canada and England, approval for himself and opposition to the proposed amalgamation. Recent purchases of large blocks of stock in the names of Mr. McMillan and others tend to confirm this view.

Mr. George S. Waterlow, who spent much time in Canada during the present year, and took great pains in promoting this amalgamation, found himself continually opposed by Mr. McMillan, and he was compelled, in the interest of the shareholders, to differ from Mr. McMillan, with whom he had been for many years amicably associated, and whose advice had been proved to be misleading. And later, when Mr. Aldrige, the eminent mining engineer, who was so prominently referred to at the last general meeting, came to England to confer on behalf of the other companies with the Le Roi Company as to the arrangements it would be possible to effect, it was found that no progress could be made so long as Mr. McMillar remained on the Board. It was thereupon intimated to Mr. McMillan that the other members of the Board were dissatisfied in two respects: (1) his management of the mine, and (2) his opposition to the proposed scheme of amalgamation. On his declining voluntarily to resign his position, the Board had no alternative, but were compelled, in the interests of the company, to exercise the power in this respect given to them by the Articles of Association.

Mr. McMillan claims for himself that he as made a great success in the past year at the mine. It is therefore necessary to state that, having regard to the much improved price of copper, and to the better results to the company from the Tacoma contract, arranged by Mr. Parrish and Mr. Wilson, the receipts of the company were, after all, disappointing; and also that larger profits would have been secured if the recommendation made by Mr. Mackenzie (but opposed by Mr. McMillan) of sending the Le Roi ores to the Trail Smelter, instead of to Northport, had been adopted.

In August, 1904, Messrs. Bradley & Mackenzie resigned their position as consulting engineers to the company, for the following reasons, given in their own words:—"We do not approve of keeping the Northport Smelter in operation under existing conditions, as the ore now mined can be sold in the open market at a rate that will effect a saving of a dollar per ton, equivalent to $80,000 a year, at the present rate of shipments." In fact, they found that their ideas, as Mr. McMillan himself expressed it, "did not harmonize" with those of Mr. McMillan. Fortunately, as Mr. McMillan has left the Board, Messrs. Bradley and Mackenzie have now consented to resume their position, and the Board are proceeding on the advice of this firm, as regards the proposed amalgamation, having full confidence in them, and knowing that they stand at the head of their profession on the American Continent.

Mr. McMillan has constantly desired to obtain full power, and to have complete control in his own hands. After the unfortunate circumstances of Mr. Parrish's management, this was conceded to him. He reported Mr. Parrish's resignation on the 27th May, 1904, and one of the early uses he made of it was to draw, for four months, Mr. Parrish's salary as general manager, in addition to his own salary as managing director, without communicating with London. This abuse of his position was only discovered in London after the receipt of the accounts from Rossland; and on the 30th November a letter was written to Mr. McMillan containing the following passage:—"The Board were sorry to find you were drawing salary at the rate of $10,000 per annum without any previous communication with the Board, especially as such action does not carry out the terms expressed in your cable of the 30th August last to the effect that you 'intended to reorganize arrangements with economy,' in consequence of which your proposal to act as general manager, as well as managing director, was agreed to by the Board." This matter was afterwards rectified as regards future payments, by allowing him to draw £1,500 a year, with the title of managing director only, in place of £2,500 a year.

The Board consider it only right to state thus much at once for the information of the shareholders, by way of reply to Mr. McMillan's circular, which might otherwise lead to much misapprehension. They will be prepared to enter at greater length into these and other matters in future. Meanwhile, they will lose no time in issuing a report, and calling a general meeting when they receive from Canada the information of shareholders' meetings having been held in that country of the other companies to be included in the proposed amalgamation; and this report will give full information in regard to these companies, which are not, as stated by Mr. McMillan, of "very doubtful merit," but which, with the Le Roi Company, are calculated to form a powerful combination capable of earning substantial and regular dividends for all the parties interested in them. In fact, the actual resources of the proposed combination will be sufficient to provide the new combined company, so to be formed, with the necessary working capital without coming to the public for subscriptions.

MINING IN BRITISH COLUMBIA.

(From Our Special Correspondent.)

The principal feature in the mining at the Coast last month was the commencement of extensive development operations at the Britannia mine. The ore is giving trouble in its reduction, as it is highly silicious and a suitable flux of oxide of iron, which it is stated can be procured in the properties of the vicinity, is now being sought for.

In the Boundary camp the principal item of news is perhaps the increase of the Granby smelter to eight furnaces in order to deal with the greatly enlarged output of the Granby mines. In addition from the Boundary come the news that the Dominion Copper Company is also likely to erect a smelter at Grand Forks. In the camp on the north fork of the Kettle River, where a new railroad is projected, which will probably find its outlet at Vernon, the McKinley, has recently been opened up in a

gratifying manner and has partially demonstrated that the ore on that property, known to be of a large extent, is of a considerably higher grade than was at first estimated.

In the Lardeau there is much work doing this summer on numberless properties and the Triune has succeeded in sending a fair amount of lead ore to the smelter at Nelson. The country, however, is so difficult, the problems of transportation as yet so unsatisfactorily settled, that it will be some time before this section pushes it way into the front rank of shipping districts.

The Slocan is generally much improved as is also the Ainsworth districts. Including the St. Eugene of East Kootenay, in the lead ore sent to the smelters the August returns for Trail and Nelson show that 2,000 tons were produced. This is not including the smelter at the Sullivan mine in East Kootenay, which for some occult reason, refuses to make public its returns month by month. From other evidence, however, the output can be safely set down as not less than 500 for August last. Were this rate kept up during the entire year, and there are indications that it will even be exceeded, the output will exceed 30,000 tons during the coming twelvemonth. This would be a larger output of lead of any since the year 1900, which was high water mark for the Kootenay lead mines. All this shows in an unmistakable manner that there is a larger number of men at work and that there is a decided boom in the mining of these districts. Indeed, it is beginning to be freely prophesied that the boom of earlier days will be repeated with even better results.

One little district of which nothing much has been heard since the days of the Quartz Creek boom in 1897, is the Ymir. Here much work is being done by a number of men, mostly poor, who are doing their best to develop a country to which they have stuck in fair and foul report for a number of years, some, indeed, dating back to the late eighties. The Hunter V., Kootenay Belle, and many another will be heard of as the next year is waning.

From Rossland comes all kinds of rumors as to amalgamations and such like. The most important piece of news in that camp is, however, the rediscovery of the famous Black Bear shoot from which so much good ore was shipped by Bernard Macdonald from the sixth, seventh and eighth levels of the Le Roi, but which seemed to have panned out on the ninth. Also it is interesting to learn that $15 ore has been found on the 1,550 level, the lowest point of the mine. This shoot, of which dimensions have not as yet been ascertained, is supposed to be a continuation downwards of that found, a blind lead, apparently, on the 1,300.

From East Kootenay comes the report that the St. Eugene is putting an additional twenty drills to work, roughly meaning 100 men. This will enable that mine to largely increase its output. What the Sullivan is doing is largely a matter of conjecture, as the management is more than ordinarily reticent, as already stated. However, the new smelter there has a capacity of at least 8,000 tons of lead annually and it is declared that the furnaces are kept busy. The Heberlein process seems to have been finally adopted, although there is no official word of its being taken over by the directors of the property.

ONTARIO MINING INTELLIGENCE.

(From Our Own Correspondent.)

The extent of mining operations at Cobalt may be judged by the number of men now employed at the principal mines: Nipissing, 71 men; Timmins, 60; White, Hargreaves & Co., 45; Buffalo Mining Co., 43; Trethewey Mine, 30; Drummond, 35; Victoria, 25; O'Brien, 20; Jacobs (Kerr Lake), 20; Violet, 18; McLeod & Glendinning, 18; Glendinning & Blair, 16; Chambers, Ferland & Co., 15; Hudson Bay and Temiskaming, 14; Watts, 8; while a number of smaller mines employ 2 or 3 each. At the Timmins and Nipissing mines good buildings have been erected. The former has an excellent bunk-house, two stories high, steam-heated, with sitting room, 30x40; reading room, library, 12 bedrooms, with four single beds each. The O'Brien mine is putting up a bunk-house, 75x30, with reading room, 30x21, on each floor; 16 bedrooms, 14x7 on each floor, for 2 men each, with a window in every room, bath rooms, wash rooms, and other conveniences. A separate building, 50x30, contains a fine dining room and kitchen. The buildings are steam-heated and lighted by electricity. The water supply is obtained from Peterson Lake, and is good; but the well from which most of the Cobalt supply of drinking water is obtained, is contaminated and has been condemned.

Prospecting is going on vigorously at Cobalt, and some new discoveries are reported. The Nipissing Co. has over 20 veins on its properties, one 18 inches wide and one 14 inches. At the Trethewey, one vein has run into Galena. The Nipissing and Timmins are now the largest producers. The Buffalo Mining Co. has traced one seam for 800 feet, but have not yet established its richness. At Geo. Clendinning's claim at Giroux Lake, a vein nearly half a mile long and averaging 8 inches wide, has been located. A 22-lb. nugget of native silver, containing 80 per cent. of metal, has been received at the Bureau of Mines, Toronto, from McLeod & Glendinning's property near Cross Lake.

The B. A. Pyrite Co. is shipping ore steadily from its mine at Queensboro, Ont., to the reduction works at Buffalo. It will soon have two drills at work, and will then be in a position to ship two carloads a day.

The Coleman Cobalt Mining Company has been recently incorporated to carry on mining in the Cobalt district, the directors and officers being Mr. R. M. Copeland, president; Mr. A. R. Moore, vice-president; Mr. H. B. Wills, secretary-treasurer; and Messrs. R. L. McCormack and Robt. Falconer. The Company owns a property of 30 acres near Kerr Lake, where a drift has been run for 45 feet into the hill and a shaft is being sunk, which is now down some 14 feet. The Company also controls a property north of Cobalt, on which no work has yet been done.

Mr. Samuel Price, who was commissioned by the Ontario Government to inquire into disputed claims in the Cobalt district, has reported, and the Minister of Lands and Mines has given his decision in several of the cases, as follows: Charles S. Haines' application for a mining lease on lot 7, con. 6, township of Coleman, refused, on the ground of no valuable discovery having been made; H. D. Graham, Walter Bowen and John McChesney, applicants for a claim on lot 3, con. 5, township of Coleman, McChesney's claim allowed; E. I. Scully applied for a claim on lot 3, con. 6, township of Coleman, but withdrew his application and subsequently asked to have it reinstated. Meantime J. O'Handy had staked out a mining claim. Scully's application to be reinstated refused.

The Ontario Reefs Mining and Development Co. has commenced operations at the copper property known as the Harmony Mine, near Sault Ste. Marie, under the direction of Mr. John Galt, C.E.

The courts are being asked to settle a dispute between Mr. A. M. Hay, of Kenora, as plaintiff, and Messrs. Roy H. Clarke and R. C. Longley, as defendants, the former demanding a specific performance by Clarke of an agreement to sell a cobalt-silver claim in the township of Coleman, and a declaration that an application by Longley for the lot was made as trustee for Clarke, and for an injunction to restrain them from selling to any other party. This is only one of numerous cases cropping up since the wealth of the Cobalt district has been established.

A petition has been sent to the Minister of Lands and Mines for Ontario, from the Rainy River district, asking a delay of a year in cancelling mining leases for default. The Minister has not yet announced his determination, but it is significant that no announcement of leases cancelled has appeared in the Ontario Gazette for the past month.

Mr. D. D. Mann, of Mackenzie & Mann, has been making a personal investigation of the Cobalt mining district.

Much dissatisfaction is expressed with the action of the Ontario Government in suspending the mining regulations, as a new law cannot be passed till the Legislature

meets, and in the meantime there will be a state of unrest and uncertainty. With a view to bringing about a satisfactory revision of the law, mining men are being asked to hold meetings in the respective districts in order to give expression to their views and select delegates to a convention to meet at the Parliament Buildings, Toronto, about the middle of November. At this convention the resolutions adopted at the various local meetings will be considered and a consensus of opinion arrived at which will assist the Government in framing a law. Meetings will probably be held at Kingston, Madoc, Haileybury, Sudbury, Sault Ste. Marie, Port Arthur, Fort Francis and Kenora, and possibly a few other points. The Hon. J. P. Whitney and the Hon. Frank Cochrane have returned from their visit to the Cobalt district, but are reticent regarding the future policy of the Government.

A vein of galena has been discovered near Lake Abitibi, by Mr. H. L. Kerr, who is in charge of an exploring party in that section.

Mr. Eugene Coste is inspecting for Messrs. Mackenzie & Mann, the Marks-Wiley mining claims in the Lion Lake district, containing deposits of hematite.

Mr. T. H. Crowley, a mining prospector of Steelton, Ontario, recently exhibited a number of mineral specimens in Toronto. In conversation with your correspondent he stated that he had for two years prospected in the Rainy River country and had found both hematite and magnetite ore north of Fort Francis. He had also discovered a mineral deposit in which there was 40 per cent. of sulphur and also arsenic, with gold enough to pay the cost of working. The vein is said to be 60 feet wide and traceable for half a mile. At Stone Dam, there is, Mr. Crowley affirms, a deposit of copper and iron with traces of nickel. It probably is part of the Missabi range and is very rich but until railway communication is established, is inaccessible. Mr. Crowley says he has formed a syndicate of twenty persons who are each investing a thousand dollars to develop an iron property at Sea Gull Lake. He claims also to having discovered corundum and dark mica near Bancroft, and a deposit of lithographic stone, at a place not indicated. Samples of the latter looked as if they might be valuable.

GOLD MINING IN NEWFOUNDLAND.

The Goldenville Mining Co., among whose shareholdare are a number of residents of St. John, N.B., has ordered from Messrs. I. Mathewson & Co., Ltd., a complete milling plant for Mings, Nfld. On the property development operations have been in progress for some time past, a shaft having been sunk to a depth of 150 feet, while a number of mill tests have been made of the ore at North Brookfield, Queen's Co., N.S. This is the first mine in Newfoundland, where gold has been found to exist in paying quantities.

THE INVALIDATION OF CLAIMS IN THE COBALT DISTRICT.

The following claims in the Cobalt district, amounting to eighty-one during the month of September, have been declared invalid by the Inspectors appointed by the Ontario Government:

6th September, 1905.

								Township of
S.E.	quarter of	South	half of	Lot	7	Concession	1	Bucke
N.E.	"	South	"	1	"	11		Lorrain
N.E.	"	North	"	1	"	4		Coleman
N.E.	"	South	"	5	"	4		"
N.E.	"	North	"	2	"	5		"
N.W.	"	North	"	3	"	5		"
S.E.	"	South	"	3	"	5		"

9th September, 1905.

S.W.	quarter of	North	half of	Lot	3	Concession	6	Coleman
N.E.	pt.	North	"	4	"	3		"
S.E.	pt.	South	"	3	"	4		"
S.E.	quarter of	North	"	5	"	4		"
N.W.	"	North	"	1	"	4		"
S.E.	"	South	"	14	"	1		Bucke
N.W.	"	South	"	15	"	1		"
N.E.	"	North	"	10	"	2		"

13th September, 1905.

S.E.	quarter of	North	half of	Lot	10	Concession	2	Bucke
S.W.	"	South	"	13	"	2		"
N.E.	"	North	"	9	"	1		"
S.W.	"	South	"	9	"	2		"
S.W.	"	North	"	10	"	1		"

16th September, 1905.

N.E.	quarter of	North	half of	Lot	1	Concession	11	Lorrain
S.W.	"	North	"	2	"	11		"
N.W.	"	North	"	1	"	11		"
S.E.	"	South	"	1	"	11		"
S.W.	"	South	"	3	"	12		"
N.E.	"	North	"	2	"	2		Coleman
N.W.	"	North	"	2	"	2		"
S.E.	"	North	"	2	"	2		"
S.E.	"	North	"	2	"	3		"
N.E.	"	North	"	2	"	3		"
S.W.	"	South	"	1	"	4		"
S.E.	"	South	"	2	"	4		"
S.W.	"	South	"	3	"	4		"
N.E.	"	North	"	5	"	4		"

South parts, South East and South West quarters of South half Lot 1 Concession 6.

20th September, 1905.

N.E.	quarter of	South	half of	Lot	2	Concession	3	Coleman
S.W.	"	South	"	2	"	4		"
N.E.	"	South	"	2	"	4		"
S.E.	"	South	"	3	"	10		Lorrain
N.E.	"	South	"	3	"	10		"
N.E.	"	South	"	3	"	11		"
S.E.	"	North	"	11	"	1		Bucke
S.W.	"	North	"	15	"	1		"
N.E.	"	South	"	11	"	1		"
N.E.	"	North	"	9	"	2		"
S.W.	"	South	"	10	"	2		"
S.E.	"	North	"	13	"	2		"
S.W.	quarter of	North	half of	Lot	14	Concession	2	Bucke
S.W.	"	North	"	15	"	2		"

23rd September, 1905.

S.W.	quarter of	North	half of	Lot	9	Concession	1	Bucke
S.W.	"	South	"	8	"	2		"
N.W.	"	North	"	10	"	2		"
S.E.	"	South	"	10	"	2		"
S.W.	"	South	"	10	"	3		"
N.W.	"	South	"	8	"	3		"
S.E.	"	North	"	1	"	11		Lorrain
S.E.	"	North	"	1	"	5		Coleman

27th September, 1905.

S.W.	quarter of	South	half of	Lot	1	Concession	11	Lorrain
S.W.	"	South	"	2	"	11		"
N.E.	"	North	"	2	"	11		"
N.W.	"	North	"	2	"	11		"

30th September, 1905.

S.E.	quarter of	North	half of	Lot	1	Concession	4	Coleman
N.W.	"	North	"	8	"	4		"
S.W.	"	North	"	9	"	5		"
N.W.	"	North	"	9	"	5		"
S.E.	"	South	"	9	"	5		"
N.E.	"	South	"	10	"	5		"
N.E.	"	North	"	10	"	5		"
N.E.	"	South	"	1	"	6		"
N.W.	"	South	"	2	"	6		"
N.W.	"	South	"	8	"	6		"
N.W.	"	North	"	8	"	6		"
N.E.	"	North	"	8	"	6		"
S.W.	"	North	"	8	"	6		"
S.E.	"	North	"	9	"	6		"
S.E.	"	South	"	9	"	6		"
N.E.	"	South	"	6	"	1		Bucke
N.W.	"	North	"	9	"	1		"
N.W.	"	North	"	10	"	1		"
S.E.	"	North	"	10	"	1		"
N.E.	"	North	"	10	"	1		"
S.W.	"	North	"	1	"	10		Lorrain

COMPANY MEETINGS.

The Star of the East M. & D. Co.—A meeting of this company was held in Peterboro during September, when the following board of directors was appointed:—Messrs. E. J. Cowain, Tweed; J. K. Dale, Franklin, Pa.; John F. Fritz, Buffalo, N.Y.; C. M. Cozad, Oil City, Pa.; Geo. F. Smith, Henry Lohrey, Thos. Hewlett, Pittsburgh, Pa.; and John R. Steele, Oil City, Pa. It was decided to provide funds for the resumption of operations at the mines in Barrie Township. The president, Mr. M. Smith, and the

secretary, Mr. A. O. Kidd, tendered their resignations and subsequently the following officers were elected:—Messrs. J. K. Dale, Franklin, Pa., president; J. F. Smith, Pittsburg, Pa., vice-president; J. W. Boyce, Peterborough, secretary-treasurer; E. J. Cowain, Tweed, manager.

The Lake Superior Corporation.

We have received a copy of the first annual report of the Directors of this company—too late, unfortunately, however, for extended notice in this issue. The following financial statement for the year ending June 30th, was submitted at the annual meeting held at Jersey City, N.J., on October 3rd:

Int. on invest secur.	$543,455
Miscel. net. int.	42,084
Total income	$585,539
Coup. from 1st mtg. bonds outstanding	452,175
Balance	$133,364
Gen. exp., taxes, etc.	98,562
Surplus	$34,802

Year ended June 30, 1905:

	Production.	On hand June 30|05.
Ore (tons)	203,569	*66,726
Steel rails (tons)	98,822	11,262
Pig iron (tons)	66,235	6,618
Ground wood pulp (tons)	27,817	2,347
Lumber sales	$233,147	.....
Scrap (tons)	.....	4,817

A large amount of coal and ore is being stocked for winter use; also wood for pulp mill.

*Since sold.

The general balance sheet as of June 30, 1905, follows:

Assets:	
Invest. loans and secur. of subsid. companies..	$51,201,928
Cash	76,095
Collateral securities	150,000
Treasury bonds	956,879
Furniture and fixtures	354
Due from subsid. companies (advances)	1,531,543
Total	$53,916,799
Liabilities:	
Capital stock	$40,000,000
Bonds	13,000,000
Bills payable	800,000
Canadian Improv. Co.	4,677
Coupons unpaid	25,900
Due subsidiary companies	29,400
Suspense account	22,020
Profit and loss surplus	34,802
Total	$53,916,799

The directors and officers were re-elected with the exception of Mr. A. P. Boller, who was appointed to the board in succession to Mr. G. P. Terrell.

The Eva Mining Company (B.C.)

The annual general meeting of the shareholders of the Eva Mining Company was held in September. The reports of the secretary, president and manager were presented.

The following directors were elected for the ensuing year: Messrs. Dr. E. C. Arthur, W. W. Beer, J. Laing Stocks, W. C. Bayley, A. H. Gracey, G. A. Hunter, and A. L. McCulloch. At a subsequent meeting of the directors, Mr. W. W. Beer was elected president; Dr. Arthur, vice-president; Mr. W. C. Bayley, secretary-treasurer, and Mr. A. H. Gracey, manager.

MINING EXHIBIT AT HALIFAX.

The Mining Exhibit at the Nova Scotia Provincial Exhibition, which was held on Sept. 14th, and following days, appears to have attracted a great deal of attention, while the display itself was of an exceedingly representative character. One of the chief features was the display of specimens of coal and minerals shown by the Government. The following companies were represented:—Inverness Railway and Coal Company, Broad Cove; the Port Hood Coal Co., Port Hood; the Cape Breton Coal Mining Co., New Campbellton, C.B.; the Gowrie and Blockhouse Collieries, Port Morien, C.B.; Sydney Coal Co.'s Collieries, Indian Cove, C.B.; Strathcona Coal Co., River Hebert, Cumberland; Intercolonial Coal Co., Drummond Collieries, Westville; the Nova Scotia Coal Collieries, Maccan; the Maritime Coal Co., Chignecto; Colchester Coal and Railway Co., Debert Field.

Among the minerals shown were specimens of gypsum, graphite, malachite, native copper, hematite and magnetite, while fine specimens of gold, quartz, etc., were shown by the West Lake Gold Mining Co., Uniacke Mine; Crease's Mine, Uniacke, King's Mine, Brookfield, Gold River, Golden Group Co., Montague, Renfrew, South Uniacke and other mines.

Both the Dominion Iron & Steel Co. and the Nova Scotia Steel and Coal Co. had interesting exhibits, the former exhibit steel rods manufactured in the Province.

NOVA SCOTIA MINERAL AND COAL PRODUCTION.

(From Our Special Correspondent.)

The following figures will probably be of interest to our readers:—

Coal Production, Jan. 1|'05 to June 30|'05 ..	2,305,209 tons
Coal production for corresponding months of 1904	2,009,483 tons

	Tons furnished.	Oz.	Dwt.	Gr.
Gold production Jan. 1|'05 to June 30|'05.	16,778	4.467	0	3
Gold production for corresponding-ing months of 1904	22,099	5.963	17	2

From the present outlook it would seem that the production of coal during the next fiscal year would compare favorably with that of the past, and that indications point to an increase in the gold yield.

Very little has been done in gold mining during the month of September, and no returns have yet been made. Gold mining areas taken in the different districts during the month are as follows: —

Gold River District	11 areas
Stormont District	62 "
Montague District	13 "
Harrigan Cove District	22 "
Little Beaver Lake District	24 "
Leipsigate District	74 "
Oldham District	8 "
Miller's Lake	16 "
Mill's Village	8 "
15 Mile Stream	36 "
Gay's River	6 "
McKay Settlement	23 "
West New Annan	55 "
Kemptville	21 "
Brookfield	22 "
Caribou	16 "
Quoddy	30 "
Total	448 areas

MINING MEN AND AFFAIRS.

Mr. G. G. S. Lindsey, general manager of the Crow's Nest Pass Coal Company, has returned to Canada from a visit to England.

Mr. J. H. Mackenzie, the well-known mining engineer, of San Francisco, has again assumed the management of the Le Roi mine at Rossland.

Mr. E. B. Kirby, who is now engaged in consulting practice is at present located at Reno, Nevada, a section which promises to afford great results.

Mr. S. S. Fowler, of Nelson, B. C., was recently retained to visit and report on the old Sultana mine, Kenora, Ontario, for an English syndicate, which has secured control of the property .

Mr. L. Muller, who has acted as foreman of the Slough Creek Company, Cariboo, B.C., for the past twelve years or so, has been appointed mine manager of the Willow Creek Mining Company.

Mr. John Hopp, whose connection with deep level mining in Cariboo, is so well known, has been appointed agent in British Columbia for the Slough Creek Gravel Gold, Limited, which has taken over the affairs of the Slough Creek Company.

Mr. W. J. Watson, who, for the past two years has acted as assistant superintendent of the Tyee Copper Company's smelter at Ladysmith, B.C., has been appointed superintendent, in the place of Mr. T. Kiddie, whose resignation has been accepted.

Col. Pellatt, one of the directors of the Dominion Iron & Steel Company, states that the company's earnings for July and August were very satisfactory, particularly those of the latter month. Both the rail and the rod mill are now proving profitable undertakings.

It is satisfactory to learn that Dr. Eugene Haanel's report on electric smelting has created a very great interest in metallurgical circles not only on this continent, but in Europe also. Of the large edition published very few copies of the work remain on hand, three thousand having been sold.

Dr. P. L. F. Heroult, technical director of the French Electro Metallurgical Society, visited Ottawa during the month in order to confer with Dr. Haanel in regard to the electric smelting experiments to be shortly carried out at Sault Ste. Marie, for which purpose the Government has appropriated $15,000.

Prof. R. H. Richards, professor of mining in the Massachusetts' Institute of Technology, in Boston, is visiting the Pacific Coast in connection with an examination of the black sands of British Columbia, at the request of the Dominion Government, made through the United States Geological Survey Department.

A public meeting was held at Sydney, N.S., on Sept. 28th, at which some four hundred people were present, to discuss the amalgamation of the Dalhousie and King's College evening classes. The meeting was addressed by Professors Murray and Carruthers, of Dalhousie; Prof. Hannah, of King's College, and others.

The Ashcroft Journal states that Mr. J. B. Hobson, manager of the Cariboo Hydraulic, has proceeded to New York to discuss the negotiations with capitalists there, who are acquiring a considerable interest in the property. The gold yield of the past season from the mine, as a result of fourteen days' washing only, was $21,000.

Mr. H. P. Dickinson, general agent of the Giant Powder Co., reports great activity in the Boundary Creek district, British Columbia, in view of the building of the V. V. & E. R'y. and the Midway & Vernon R'y. On the former some six hundred men are now engaged in construction work. Mining in the district is in a very prosperous condition.

Mr. Jno. E. Hardman, the well known consulting mining engineer, who for the past ten years has occupied offices in the Windsor Hotel, Montreal, has, this month, removed to Room 10, 171 St. James Street. These latter offices are very centrally located in the business section of the city, and consequently Mr. Hardman's clients should have no difficulty in finding him.

A very representative exhibition of British Columbia minerals was shown at the recent Dominion fair held at New Westminster, B.C. This collection was in charge of the Assistant Provincial Metallurgist, Mr. H. Carmichael. In addition to the specimens contributed by the Provincial Museum a fine collection of minerals from Barkerville was shown, as well as an exhibit of gold from Atlin.

In reporting the departure of Mr. Norman Carmichael, who has been appointed to fill an important position with the Arizona Copper Company at Morenci, the Nelson Daily News remarks that Nelson looses a good citizen, and the local mining district one of the most competent engineers that have been identified with this development. Mr. Carmichael came to Nelson in 1895, and has been connected with the Hall mines, Fern, Molly Gibson, Duncan, Granite and Highland mines.

The Victoria Colonist, in a recent issue makes the following very pertinent enquiry, a really straightforward reply to which should prove of considerable interest:—

"The Globe, in its editorial notes and comments, remarks that 'the mining interests of Cobalt should be willing to regard a royalty on the output of rich mines in the same light as a rake-off for the house on each 'jack-pot.'" That is a very practical way to look at the subject of royalties, but the question that arises is, how comes the reverend editor of the Globe to have such a familiarity with the expressions of the gaming room and the methods there employed?"

Mr. Frank H. Sherman, labour candidate from Frank for legislative honours in the new Province of Alberta, has issued an address to the electors of the Pincher Riding, outlining his views. Some of the planks of his platform are of an extremely radical character, including public ownership of all public utilities, while he also advocates an eight-hour law for miners and a workmen's compensation act. Referring to the coal mining legislation, Mr. Sherman, who is, by the way, president of the local union, expresses the opinion that the present laws for the regulation of coal mines in the province are capable of many improvements, and measures should be passed having that end in view.

The Daily Whig, of Kingston, in a leading article, entitled "Canada for Canadians," quotes the following paragraph from the Muskegon (Michigan) Chronicle. "Reginald R. Hemp, of Muskegon, has been appointed on the assay and mineralogical corps in the Cobalt and Nickel Nipissing mining district, Ontario. A request for five men was sent to the Michigan Mining School at Houghton, in which he is a student. He was one of the five to be selected. His appointment is for one year, after which he expects to return to Houghton for another year to complete his course." Commenting thereon, the Whig rather indignantly asks why the Ontario Government did not appoint for this office competent students from the Kingston School of Mines.

Referring to the mining developments up the West Fork of, Kettle River, the Boundary Creek Times thus rather trenchantly, criticizes the work that is being done at the Carmi by an English syndicate:—"The work so far done on the Carmi has not been what might be termed economical or practical-mining. A large sum of money has been expended in equipment for the development done. However, the machinery is on the ground and in good condition. The state of the machinery may be accounted for by the fact that an order comes to the mine occasionally to have it "unwatered." Then steam is got up and the pumps worked night and day until the mine is clear. A few days after a cable will be received: 'Close the blarsted mine until the tennis season is over!'"

Not unnaturally, the recent arrangement by which the Le Roi ore is to be shipped to the Trail smelter, causes considerable annoyance to the Northport Republican, the local newspaper published in the little town of that name This organ of Northport public opinion takes up the cudgels for Mr. McMillan, but in the course of its argument makes some statements that are, to put it mildly, contrary to fact. Thus, it is stated that Mr. E. S. Waterlow (sic) was appointed a director of the Le Roi Company, by Mr. McMillan, while Mr. F. W. Rolt, recently elected to the board, is described as a director of several mining fiascos in British Columbia; but we do not suppose that either Mr. Waterlow or Mr. Rolt will think it worth while to commence an action for libel against the Northport Republican.

At the annual meeting of the Lake Superior Corporation, Mr. T. J. Drummond was re-elected vice-president of the company.

Dr. Ledoux, of the well known New York metallurgical firm, visited Cobalt, Ontario, during the past month. Already nearly 100 carloads of ore have been received at the Ledoux & Company's works, from this section. Dr. Ledoux, however, is reported to have stated that practically the whole production of the Cobalt camp is at the present moment being stored in New York, awaiting treatment.

On the departure of Mr. Thos. Kiddie, who for the past several years has done excellent work as manager of the Tyee Copper Company's smelter at Ladysmith, he was tendered a banquet by the citizens of that town, and also presented with an address and a handsome gold watch, on which the following inscription was engraved:

"Presented by the employees of the Tyee Smelter to Thomas Kiddie, Esq., on the occasion of his retiring from the service of the company. Ladysmith, B.C., Sept. 15, '05."

It is interesting to note the difference between the steel rail exports from the United States into Canada for the first eight months of 1904, which amounted to 93,256 tons, as compared with 4,680 tons consigned to this country during the corresponding period of this year. In this connection the Wall Street Journal remarks that the "American steel rail pool are receiving an object lesson in the practical working of the protective duty when the shoe is on the wrong foot. They were unable to bid for any part of the order for 150,000 tons of steel rails just given by the Grand Trunk Pacific to the Dominion Iron and Steel Company, because of the new Canadian duty of $7 a ton levied on all steel rails bought in the United States."

MINING STATISTICS.

The coal shipments from Nova Scotia, last month, were as follows:—

Dominion Coal Company	307,084	tons.
Cumberland Railway & Coal Co.	39,208	"
Acadia Coal Company	21,710	"
Nova Scotia Steel & Coal Co.	61,723	"
Inverness Railway & Coal Co.	9,867	"

The following is a detailed statement of importations of copper and copper ore from British North America, as per official returns of the United States Bureau of Statistics (ore in tons of 2,240 pounds—copper in pounds):—

Month of August—	Ore.	Copper.
From Canada	.....	51,284
Nova Scotia	.....	10,715
British Columbia	10,634	1,573,665
Total for August	10,634	1,635,664
Previously reported	77,200	13,322,445
Total for 8 months	87,834	14,958,109

Smelter returns for August from the Nelson and Trail smelters show production of 2,072 tons of lead. The Marysville smelter will not publish its figures, but the output is estimated at 500 tons at least. This rate shows a production of 30,000 tons of lead for the year, which was only beaten in 1900 with 31,000 tons. The production in 1905 was 18,000 tons; 1903, 9,000 tons; 1902, 11,000 tons. A great revival is thus shown.

The production of the Rossland mines for the nine months ending September 30th, aggregates 252,063 tons.

Boundary district ore shipments for the nine months of the present year total 652,651 tons.

The gold output in Nova Scotia in 1903 was 27,779 ounces from 103,856 tons of quartz crushed. Last year the output was only 11,273 ounces, from 45,436 tons of quartz. This is a reduction of 16,496 ounces, a falling off of considerably more than a half, and it is understood that for the current year the decrease is still more pronounced.

COMPANY NOTES.

A meeting of the directors of the Canadian Northwest Oil Co. was held at the 88 Government Street, Victoria, on Sept. 11th, when arrangements for the early commencement of work at the company's property were made.

Tyee Copper Company (V. I.).—During the month of August the smelter was in operation for twelve days, treating 2,018 tons of ore from the Tyee mine, from which a return was obtained after the deduction of freight and refining charges of $39,110.

Le Roi No. 2 (Rossland).—The report of the manager of the London office, for August, was as follows:—"Shipped, 780 tons; the net receipts are $2,563, being payment for 191 tons shipped, and $2,098 being payment for 63 tons concentrates shipped; in all, $4,661; in addition to above, received $4,125 for 350 tons ore on dump; the total receipts for the month are $8,787."

Le Roi.—The manager reports as follows:—"Shipped from the mine to Northport during the past month 9,158 tons of ore, containing 3,697 ozs. of gold, 3,600 ozs. of silver, and 211,250 lbs. of copper. Estimated profit on this ore, after deducting cost of mining, smelting, realisation and depreciation, 25,000 dols. Expenditure on development work during the month, $8,500. Shipped from the concentrator to Northport 71 tons of concentrates, of an estimated value of $960. Have found extension of Black Bear ore-shoot, 900-feet level; promises large tonnage. Have found the ore at 1,550 feet level. Average value, $14. Extent at present unknown."

Giant Mining Company, Limited, London, E.C.—Lien registered August 12th, for £1,000 six per cent. debentures, part of £9,000; amount previously issued, £8,000; no trustees; charged on the undertaking and all the property, present and future, including the uncalled capital for the time being.

Granby Company.—A Boston report states that in January next a dividend of five per cent. will be paid by this company. The net profits are stated to be at the present price of copper, $2.00 per ton, while it is also said that for some months past the ore shipped has shown higher gold values.

Arlington (Erie) B.C.—The manager sends in the following information:—"During the month of August 130.7 tons of ore were shipped to the Hall mines smelter, the net returns on which amounted to $6,120.42. The expenses, including development, were $4,488.23. The directors of the Hastings (B.C.) Exploration Syndicate, Ltd., have granted a bonus of one month's salary to the company's officials in B. C. and to the miners and other men working at the Arlington mine a bonus of two and one-half shifts.

Slough Creek Co.—The following circular has been issued from the office of the Slough Creek Gravel Gold Company by the secretary: "Mr. J. D. Kendall, the consulting engineer, who, as you are aware, has again visited the property, writing on August 18th, states: I am glad to inform the directors that I consider the pumping capacity is fully able to cope with the overflow of water—the surface level of which has fallen over three feet during the last seven days—and I am certain that the water difficulty is now quite overcome. Owing to the still considerable outflow, I have been unable to take large samples, as I had intended, for testing purposes, but I have obtained sufficient to fully confirm my previous estimate (a minimum net profit of 10s. per cubic yard). Development work is proceeding rapidly, and a new drive has been started near the end of No. 2 upraise, which will have the effect of more speedily draining off the water. Machinery of every kind is in perfect order, and equal to any demands that may be made on it, and the position at the mines is most satisfactory."

COAL MINING NOTES.

NOVA SCOTIA.

A strike was declared at the Springhill colliery during the month, but, fortunately, was of short duration, the matters of difference between the Company and the men being amicably arranged.

It is reported that the Dominion Coal Co. has in contemplation the construction of an electric plant near its No. 2 colliery, which will be used as a central power station for all the mines operated by the company in the vicinity of North Sydney, C.B. Should the project be carried out, the pumping at all the operations will be performed by electricity, and the fans will also be electrically operated.

Thus says the Eastern Chronicle, "We learn that at the Allan Shafts during the month of August there was some phenomenal work done. One of the shafts was sunk in the month a depth of 128 feet, and 100 feet of the distance was timbered. This will constitute almost a world's record. Recently a shaft was put down 107 feet in a month in a coal mining town in Pennsylvania and the fact was heralded everywhere. The workers at Lourdes have this beaten by 28 feet. Mr. W. H. Hyde was in charge of the work at Allan Shaft.

ONTARIO.

Bituminous coal is reported to have been discovered near Ennismore Township.

ALBERTA.

The strike of the coal miners at Frank, which continued for three weeks, was brought to a termination on the 30th of September, when the company arranged terms which have been accepted by the miners.

The Canadian Metal Company has leased from the Canadian-American Coal and Coke Company, the coal seam at the north of the C.P.R. tracks, known as the north tunnel. The vein debouches almost immediately into the smelter, which renders the obtaining of a coal supply an exceedingly simple and economical matter. The deal is of great importance to the metal company as by operating its own colliery, mines and smelter it will be able to conduct its business at a minimum cost.

At the mines of the International Coal & Coke Co., at Coleman, an output of some nine hundred tons of coal per day is being maintained. The company are giving employment to about three hundred men, a large part of whom are engaged in pushing development work. The No. 2 entry has reached a depth of 4,000 feet while the No. 4 is in over 2,700 feet while the slope being sunk has reached a depth on the coal of over seven hundred feet.

BRITISH COLUMBIA.

It is a matter of congratulation that the strike which has been in progress for the last four months at Nanaimo has been declared off, the Western Fuel Company having reached an agreement with its employees covering a period of two years.

It is reported that Mr. James Dunsmuir has purchased 2,800 acres of coal lands, near the mouth of the Coldwater River, in the Nicola district, and that development operations are shortly to be commenced under the direction of Mr. W. J. Sutton.

MINING NOTES.

NOVA SCOTIA.

It is reported that a valuable discovery of mica has been made in the vicinity of West Bay. Development work is now in progress.

Referring to the financial position of the Dominion Steel Company, a correspondent writes:—

"The earnings for the first four months of the year amounted to about $315,000, which, after providing for all fixed charges, including sinking and redemption funds, left a surplus of nearly $25,000. Since then the rail mill has been started up, and its earnings will consequently be clear profit to the company.

"As the sinking and redemption funds will amount this year to $200,000, and next year to $290,000, it would be quite reasonable to expect that some reorganization scheme will be arranged next year, following the example set by the Dominion Coal Company, which will provide for the redemption of the existing issues of bonds, so as to obviate the large annual payments for sinking and redemption funds, and leave a large amount available for dividends.

"The large demand for steel rails, structural steel, steel rods, etc., which is assured for years to come owing to the building of the Grand Trunk Pacific, the extension of the Canadian Northern, the double tracking and new branches of the Canadian Pacific Railway and the various other railroad enterprises in Canada, ensures a large and increasing market for the output of the company.

"It would seem, therefore, that the premier securities of the company, the first and second mortgage bond issues, are now on a stable footing, and should command the attention of both the investing and speculative public.

"The first mortgage 5 per cent. bonds, due in 1929, of which there are $7,876,000 issued, have behind them the following securities, the market value of which is as follows:—

$2,400,000 second mortgage bonds at $2....	$1,968,000
$5,000,000 preferred stock at 72.....	3,600,000
$20,000,000 common stock at 21 1-2.....	4,300,000
Total	$9,868,000

"The second mortgage 6 per cent. bonds, which are payable in ten annual instalments, have behind them the preferred and common stock, the present market value of which is $7,900,000, or nearly four times the value of the issue.

"Under these circumstances the first mortgage bonds now selling at 85, which yield 5.88 per cent. on the investment, and the second mortgage bonds, now selling at 82, which yield about 11 per cent., certainly look attractive."

The prospects of the Dominion Coal Company and the Dominion Iron & Steel Company appear, at the present time, to be exceptionally good. The Dominion Coal Co., however, has paid no dividends on its common stock since January, 1904, but the dividends on the preferred have been paid regularly. It is generally believed that the refunding plan of the Dominion Coal Co. means the resumption of dividends on the common stock in the near future. The balance applicable for dividends on the common stock at the end of the last year was $890,338, or not quite six per cent. on the $15,000,000 common stock. The fixed charges for that period were over $730,000. By the refunding plan, this amount has been reduced to $460,000, a saving of $270,000 per year and which on the net earnings of last year would have shown eight per cent. on the common stock.

A despatch from St. John's, Nfld., states that the directors of the Nova Scotia Steel & Coal Company propose to commence immediately operations to develop the recently acquired submarine ore deposits at Bell Island. The company has just purchased these extensive areas on the north side of Bell Island, as the ore beds on the island were beginning to run short. The company had six million tons and was excavating at the rate of half a million tons a year, so the life of the terranean areas was but twelve years. The engineers of the company estimate these submarine areas to contain three or four times as much ore as has been found on the whole of Bell Island, or 150,000,000 tons in all. It is certain that the ore extends under the waters of the bay, and the fact is that ore is now being mined by the Nova Scotia Company below the sea level. The company's engineers have been carefully looking into the question and they are convinced that the ore will be found to continue in the submarine areas. The work, so far carried on, has proved that the estimate originally made by Mr. R. E. Chambers, M.E., as to the quantity of ore is practically correct. The Scotia Company has, in its land areas at Wabana, more ore unworked than the new blast furnace at Sydney Mines can use in thirty years, although the capacity of the furnace is more than double that of the Ferrona furnace. As regards the cost of operating these submarine areas the engineers estimate that ore in these marine areas can be got out as a cost of only a few cents per ton more than the present ore from the underground areas on the island. The company now has a very extensive plant, including a shipping pier, tramway,

etc., already established on the island, and is in a position to mine this ore without the large initial cost which would have to be incurred by a new company undertaking the work.

During the month a party, including Messrs. Thos. J. Drummond, president, and Geo. E. Drummond, of Montreal; John L. Drummond, of Midland; Edgar McDougall, vice-president, Montreal; W. M. McLeod, London, England, and C. W. Brega, Chicago, director of the Londonderry Iron and Mining Co., and Geo. Beatty, general superintendent, and W. F. C. Parsons, superintendent of mines for the company at Londonderry, visited the Torbrook-Nictaux iron district, to inspect the mines purchased from the Torbrook Iron Company, and the properties held by Mr. Geo. E. Corbitt on the farms of F. Wheelock, M. Hoffman and Arch. Banks, which the I. L. & M. Co. has been developing. It is understood, that as a result of their visit more extensive operations will be carried on.

A Halifax despatch says the Nova Scotia Steel Company has sold the abandoned works at Ferrona, and the mine there for $200,000, making a better sale than had been expected.

ONTARIO.

During the month the Craig mine produced a gold brick valued at $2,200, as a result of eleven days' crushing.

The mica property in Burgess is about to be extensively worked by the lessees. The mine was abandoned some four years ago.

In the Manitou section the Big Master mill is now being operated with double shift, while at Dryden the Redeemer Mining Company, an American corporation, is installing a cyanide plant in conjunction with the mill.

Prof. Miller, provincial geologist, reports an important discovery of Bessemer iron ore at Loon Lake, east of Port Arthur. It is said the deposits are much more extensive than first supposed, and that the quality is of a high grade.

The Lake Orion Oil & Gas Co. is reported to have struck a big gusher, which is flowing at the rate of over 600 barrels per day, on their property, at a depth of 1,078 feet, and the company has now drilled ten wells, all of which, with one exception, have been largely productive.

Three enormous ingots of silver have been recently discovered on the Timmins property, Cobalt. The first of these was discovered last year, and realized over $1,000, while two others have been found during the past month, weighing respectively 160 and 260 lbs. The latter will probably be placed in the museum of the Geological Survey of Ottawa.

The Lake Erie Gas & Oil Company have leased 30,000 acres of land in the first and second concessions of Yarmouth, Malahide and Bayham, between Port Stanley and Port Burwell, in Elgin County, have contracted with local Leamington men for the sinking of three wells until Medina sand shall have been struck, the limit being 3,000 feet.

A correspondent writes from Cobalt:—"There have been no new strikes of any importance recently, so far as I have yet learnt, except the Glendenning discovery on J. B. 8 north of Giroux Lake, where I understand they have done one of the largest outcrops of silver-bearing calcite so far discovered in the camp. It is claimed to be very rich in silver, carrying very little cobalt, nickel or arsenic. In this respect it is very similar to the vein on the Lawson property, which it adjoins."

ALBERTA.

Arrangements are being made for the erection of large cement works at Calgary. This undertaking has been initiated by the principal shareholders in the Vancouver-Portland Cement Works, which has established works at Tod Inlet in Vancouver Island.

What is described as the biggest strike of oil ever made in Canada is reported to have occurred on the property of the Rocky Mountain Development Company, where a gusher was struck at a depth of 1,400 feet, the flow from which has yielded 8,000 barrels daily. The oil lands are situated about thirty-five miles southwest of Pincher Creek and about five miles from the International boundary.

BRITISH COLUMBIA.

Atlin.—According to a report in the Atlin Claim the most valuable clean-up ever made on a claim owned by an individual in this district was made recently on the Ruffner property at Pine Creek, when gold to the value of $60,000,00 was recovered, this being the third clean-up on the claim this season.

The gold commissioner has cancelled a number of leases in the O'Donnell Valley, and a large area will consequently be thrown open for re-location by prospectors and others.

Coast.—The San Juan Mining and Mfg. Co. has been organized in Victoria to operate a group of claims in the San Juan district and the West coast of the Island. These properties include, according to prospectus issued.

It is stated that shipments of five per cent. copper ore are being made at the rate of four tons daily from the Britannia mine to the wharf, for shipment to the Crofton smelter, ore of a lesser grade than this being sent to the concentrators. It is, meanwhile, reported that arrangements are in progress to drive a tunnel a distance of 1,900 feet into the mountain between the Britannia Copper Syndicate's workings and the Empress group of claims, which were recently acquired by Mr. S. S. Raymond, of the North Penny Mining Company of Wyoming, by which, it is expected, the Britannia lead on the Edith fraction, and the Fairview claims, while also the ore body on the Barbara fraction and Empress claims, will be opened up.

The Cuba Silver Mining Co., on Loughboro Inlet, contemplate commencing shipments to the Crofton smelter this month. The property, however, is still in the prospect stage of development, though promising well.

Operations have been commenced by the bondholders on the Copper Queen property, Texada Island, while the Cornell has been leased to the Cordellero Mines Co., of Seattle, and the property is being unwatered.

Mr. F. W. McCrady, the engineer in charge of the Cuba properties on Loughborough Inlet, in a recent interview stated that in his opinion the output from the Coast mines this year would show an increase of 100 per cent. He further stated that: "Five years ago the cost of smelting coast ores was $8 per ton, and the price paid miners for copper was 6 cents per pound less than the New York quotation of the day of sampling. Now we get our copper ores smelted for $2.50 a ton, and the price paid to mines by smelters is 3 cents per pound less than the New York quotation of the day of sampling. Formerly the price paid was on casting copper, while now it is based on electrolytic copper, which is from a half to a cent a pound higher than casting copper. This advantage to the mines can be put in a few words by saying that a five per cent. ore five years ago would not net the mine enough to pay smelting and freight charges, whereas to-day a five per cent. mine would have $10 left over and above freight and treatment. In the districts of British Columbia last year the Coast stood third in the amount of copper produced, while the average assay was highest."

Cariboo.—The Transvaal group of copper claims, situated 18 miles southeast of Ashcroft, were recently bonded to Mr. Jno. M. Turnbull, of the Trail smelter, representing Canadian capital. The property was bonded last year to Messrs. J. D. Sword and Smith Curtis. The price is said to be in this case $100,000.00, and the properties are believed to be most promising.

The Lightning Creek Gold, Gravel and Drainage Company has struck the old channel of Lightning Creek on its Wing Dam property at a depth of 165 feet. Prospects were obtained from bed-rock, and were found to contain good values.

Indications of petroleum, discovered by Mr. R. T. Ward, in the Beaver Valley in this district last year, have been recently investigated by a Mr. Jas. Hardie, described as an oil expert, who states that the prospects are exceptionally promising.

Lardeau.—A steam drill and compressor plant are being installed on the Silver Dollar property at Camborne, while the erection of a mill is also contemplated at the Beatrice, in the same locality. At this latter property extensive development operations are to be carried on during the winter months.

Mr. John Keen, of Kaslo, referring to conditions in Poplar Creek section, remarks that prospectors in the locality having failed to secure outside support, are proceeding with a considerable degree of success to develop their own claims, being assisted by local capital, supplied in part by the railway and steamship officials, who, like the prospectors, have unlimited faith in the camp.

The force of miners at the Silver Cup mine has been increased, and the property is said to be now looking better than at any time in its history.

Slocan.—The Monitor Company's new concentrator and zinc separating works at Roseberry are now nearing completion and operations, it is thought, will be started in the next few weeks.

The vein of the Last Chance, where recently developed at 1,250 feet from the portal of the adit, has changed in character to a dry ore, running from 3 to 30 per cent. lead and from 100 to 400 ozs. in silver, several carloads of this ore being shipped to the Hall Mine smelter.

The manager of the Payne has been notified as follows in regard to the duty on zinc sent from British Columbia into the United States: I have to advise you that unless otherwise instructed Collectors of Customs will continue to classify zinc ores bearing lead, without regard to percentage of lead, as lead ores under paragraph 181 of the existing tariff act. However, duty at the rate of 1 1-2 per cent. will be collected on the lead contents only.

During the month an air compressor has been installed at the Ottawa, while active development work has been in progress at the mine.

Mr. C. Fernau has commenced an action against the Monitor Ajax fraction for breach of contract in connection with the building of the Roseberry zinc plant.

Nelson.—Foundationless reports of rich strikes at the Ymir mine have been made from time to time during the last few years. Another rumor of the same character, though possibly having more substance, has now been received, to the effect that new ground has been opened up in the lower levels of the mine. The manager, Mr. Hand, reports that the ore is high grade and that he has every reason to believe the discovery to be an important one.

A local company has been promoted to work the Ark group of claims near Hall Siding, on the Nelson & Fort Sheppard Railway. The group comprises eight claims, two of which have been found granted on Sixteen Mile and Clear Water Creeks. The ore is iron pyrites, carrying values in gold. The company purposes carrying on development work throughout the winter months and erecting a five-stamp mill next spring.

Mr. P. Clark has recently bonded the Devlin group on Sheep Creek, a free milling property, for the sum of $75,000.

Some interest is excited over recent discoveries on the La France claim situated east of Crawford Bay. At a depth of 150 feet another vein has been encountered which carries values in gold and silver of $50.00.

Rossland.—Some important installations of machinery have recently been made at the Le Roi No. 2. These include a hoist, ordered from San Francisco, and a 150 h.p. electric motor, ordered from Peterborough, Ontario.

At the Le Roi mine preparations are being made for continuing the main five-compartment shaft below the 1,350 ft. level. This announcement is supposed to indicate that the explorations betwen this and the 1,550 ft. level, which have been in progress for nearly a year have opened up ore deposits to a sufficient extent to justify this development. Meanwhile the Le Roi is now shipping regularly to the Trail smelter.

Another gold-copper furnace will be added to the present equipment at the Trail smelter. There are already four copper furnaces with a combined capacity of about 1,000 tons a day. The smelter is now receiving about 4,000 tons a week from the mines of Rossland, and from 100 to 200 tons a week from Larson, Idaho. The Le Roi will send a little over 2,000 tons a week at the start, and this, with the ore from the other mines will make just about sufficient for the present capacity of the copper furnaces, without the use of the one to be installed. The new furnace will reduce about 250 tons a day, or 1,750 tons a week, which will give a total capacity of 8,750 tons a week for the five furnaces. This will be ample and will allow for contingencies such as breaking down of furnaces or the necessary stops for epairs.

Boundary District.—The Phoenix Pioneer is authority for the statement that something over two miles of diamond drilling exploration work has been performed by the Granby Company on its properties in this district during the last few years. The greater proportion of this work of the drilling has been done since 1904. Two machines are in operation, and worked with double shifts, the drills being operated by compressed air.

It is stated that the British Columbia Copper Company has finally decided not to move its smelter from Greenwood to Midway, or elsewhere, but to extensively enlarge and probably in some respects remodel the present reduction works.

Mr. Samuel Newhouse has returned to Salt Lake City after a visit of inspection to the Dominion Copper Company's properties in this district. Mr. Newhouse, in an interview, stated that he was well satisfied with the mining prospects. The companies propose taking active steps towards developing the mines with a view to making heavy shipments in the near future, while also large additions will be made for the present facilities.

Work was recently resumed on two important properties in this district, which have not been operated for some little time. Of these the Elkhorn adjoins the Providence and the Jewel in Long Lake Camp, is owned by the Jewel Gold Mines, Ltd. The Jewel was recently examined by engineers on behalf of the Le Roi No. 2 Co., of Rossland.

Since the commencement of construction on the Midway & Vernon R'y. considerable interest has been taken in mineral occurrences on the main Kettle River, and during the month the Lottie F. group, not far from Canyon City, was bonded for $60,000. The ore carries, it is said, good values in gold and copper.

Mr. W. Yolen Williams is directing development operations of the Lakeview and Dividend group of claims, recently acquired under bond by the Granby, near Osoyoos.

It is reported on good authority that the net earnings of the Granby Company, for the year ending June 30th, aggregate $700,000, as compared with last year's profits of $283,000.

Considerable inconvenience has been occasioned by the lack of power in this district, the Granby Company, on this account, being obliged to reduce the smelting capacity of their works to six furnaces. Power has previously been supplied by the Cascade Power Company, but the increased activity in the district has overtaxed this company's capacities and additional power will shortly be transmitted from Bonnington Falls by the West Kootenay Power & Light Company.

Similkameen.—At Hedley City the Nickle Plate Mine is being extensively operated, from 100 to 125 tons of ore being crushed daily. The values saved on the plates vary from $4.00 to $10.00. The ore is now being quarried largely from the surface.

East Kootenay.—The output of the St. Eugene mine for August amounted to 3,200 tons of ore and concentrates. Three new boilers were recently installed at the mine.

Already the enlargement of the Sullivan smelter is mooted. The mine has been in operation since the 1st of July last, and a very considerable tonnage of ore has been extracted.

YUKON.

Very promising quartz developments seem to be taking place at Windy Arm, not far from Cariboo Crossing, where a Mr. J. H. Conrad is opening and equipping several properties, including the construction of an aerial tram line, four miles in length. Already a quantity of ore has been shipped to the Ladysmith smelter, Vancouver Island, which has been found to be exceptionally rich.

Already from the Northern Gold Fields, including those of both United States and Canada, gold to the value of fifteen million dollars has been brought down and deposited with the United States Assay Office at Seattle. It is probable, however, that not more than a third of this amount has been derived from British sources.

The recently re-organized Five Fingers Coal Company has procured from the Government the use of a diamond drill plant, with which to prospect the property during the winter. Coal from this property has already been used in Dawson, and has been found to be of an excellent quality. Providing the exploration work proves satisfactory it is proposed to equip the mine with modern machinery.

It is reported from Dawson that the Government surveyors who are now in the field securing information for a proposed Government water system, will continue their investigations for some weeks yet, after which information will be compiled and submitted to the Ottawa authorities during the winter months, to admit of the commencement of actual construction operations in the spring.

A correspondent, writing on the developments in the Windy Arm quartz section, states that up to the present time more work has been done on the Montana mine than on other properties. Here a tunnel has been driven to a distance of over 250 feet, mostly through ore which gives extraordinary high values. This is now being shipped to the Coast smelter. Adjoining the Montana are the Mountain Hero and Glacier claims, and on the latter and 1,550 feet from the Montana tunnel is being run into the mountain side, which will tap the Montana tunnel.

The chief operator in this district is Mr. J. H. Conrad, who has re-organized a number of companies to operate the respective properties.

During August two new dredges in the Yukon, one, the larger of the two, on Bear Creek, and the other owned by the Canadian Dredging & Mining Company, at Ninety Below on Bonanza Creek. This dredge was constructed by the Risdon Iron Works at San Francisco, and is equipped with a 60 H.P. engine and a 70 H.P. locomotive boiler. There are 35 buckets, each of which carry 2 1-2 cubic feet of dirt. A special appliance on this dredge is an arrangement of nozzles, which are used to wash the buckets as they are emptied, in order to save the fine gold. The nominal capacity of the dredge is 2,000 yards per 24 hours.

A nugget, said to be worth $614, has been found at Livingston Creek in the Big Salmon district. This is believed to be one of the largest nuggets found in the North for some time past.

ZINC IN BRITISH COLUMBIA.

Mr. Jno. L. Retallack has addressed a letter to Mr. Phillip Argall, one of the Zinc Commissioners, in British Columbia, containing the following information in respect to the zinc resources of that province:

Zinc ores occur in commercial quantities in the following districts of this province; although production has been practically confined to the Slocan region:

West Kootenay:—In the following mining divisions: Ainsworth, including Ainsworth and Blue Bell camps, Kaslo district, and perhaps some of the creeks draining into the Lardo and Duncan rivers, Slocan, Nelson, Arrow Lake, Lardeau and Trout Lake.

East Kootenay:—In the Fort Steele and Golden mining divisions.

Coast—Lynn Creek, near Vancouver, and on Texada Island.

Vancouver Island:—Quatsino Sound and Hesquoat Harbor.

Mention is also made of occurrences in the Kamloops, Kettle River, and Similkameen mining divisions of Yale districts, which appear to deserve further enquiry.

So far as known zinc ore does not occur in commercial quantities in the following mining divisions. Windermere, Yale, Osoyoos, Revelstoke, Illecillewaet, Vernon, Ashcroft; regarding New Westminster, whilst the report of the mining recorder is negative, Lynn Creek and Texada Island are in this division.

As regards the detailed list of properties, I cannot give you my opinion as you request, but I believe that all the undermentioned deserve investigation. As before stated, I make no claim that this list is complete:

Ainsworth Mining Division.—Ainsworth Camp, Krao, United, Arkansas, Chief, Glengarry, Union, Last Chance, Tariff, Libby, Laura M., Gallagher, Ayesha, Blue Bell Peninsular, Blue Bell, Kootenay Chief, Comfort, Crawford Creek, Silver Hill, etc.; Kaslo district: Cork, Providence, Montezuma all on south fork of Kaslo Creek, Whitewater, Whitewater Deep, Wellington, Jackson Mines, Bell, on the south fork of Kaslo Creek, and some prospects in the vicinity of the last named property.

Slocan Mining Division.—Lucky Jim, Dardanelles, Rambler-Cariboo (not for its zinc values, but as an example of what is, here, deep development), Payne, Washington, Surprise, American Boy, Last Chance, Gray Copper, Slocan Star, Ruth, Ivanhoe, Monitor, Idaho, Mountain Chief, Bosun, Hewitt, Galena Farm, Wakefield, Enterprise, Emily Edith, Hartney, Sorinth.

Nelson Mining Division:—Molly Gibson mine and prospects in that vicinity.

Arrow Lake Mining Division: — Deposits on Bald Mountain, Pingston Creek, on west side of upper Arrow Lake, and prospects at Burton City.

Lardeau Mining Division:—Sirdar on Goat Mountain, Beatrice on Mohawk Creek.

Trout Lake Mining Division:—Various properties near Ferguson which, in producing a marketable silver or silver-lead product, have difficulty with the zinc tenor of their ores.

Fort Steele Mining Division:—St. Eugene Mine and Aurora on Moyie Lake, Estella group on Tracey Creek, Watson and Kootenay King on Wild Horse Creek. Some prospects and the operation of mines near Kimberley, might well enter into this inquiry.

Golden Mining Division:—Old Lanark Mine at Field, Giant on Similkameen Mountain.

For the Similkameen, Kettle River, Kamloops, New Westminster and Quatsino mining divisions, please see correspondence. The Lynn Creek deposits near Vancouver and the Peerless property on Murray Crek, Quatsino Sound are especially mentioned.

THE NEW ZINC REDUCTION PLANT AT FRANK.

The new zinc smelting plant at Frank is now completed, and it is expected that the works will be in active operation within the next few weeks, when a general custom business will be conducted, while also ore from the Company's own properties in the Ainsworth district will be treated. In this connection the Sandon Mining Standard remarks:

The establishment of a domestic zinc smelter at Frank will by no means force the treatment of the zinc ores at home. Although the freight rate on the crude ore will be less to the home plant, the distance to market will be a serious item, and the difficulties attending the acquirement of a settled metallurgical practice will be many. When the freight to market is considered, with the expenses of marketing, the nearer market in the States, coupled with the competition of the plants who have the market at their door, will be a serious factor.

Already the local plant is realizing this, and is protecting itself by taking options on zinc ore prospects. This will render it independent of a source of supply by purchase. The natural tendency in tariff matters in the United States will be toward the reduction of duties on raw mate-

rial. Retaliation in trade matters will force them to reduce. All countries reduce first the duties on raw materials, and the need of foreign markets will force the United States into the same.

BOUNTIES ON STEEL.

Under the act the following companies have earned Dominion Government bounties for the production and manufacture of steel in the Dominion during the years 1898-1905:—

N. S. Steel Company	$276,278
N. S. Steel and C. Co., Limited	596,693
Mineral P. Co., Pictou, N.S.,	7,378
Dom. I. and S. Co., Limited	2,252,455
Canada Iron Furnace Co.	447,657
Ont. Rolling Mills Co.	18,712
Ham. Blast Fur. Co.	203,080
Ham. S. and I. Co., Limited	846,144
Deseronto Iron Co.	133,134
John McDougall and Co.	26,264
Electric Reduction Co.	2,222
Algoma Steel Co., Limited	328,740
Londonderry I. and M. Co.	64,493
Montreal Rolling Mills.	1,545
Total	$5,204,755

COPPER MARKET SITUATION.

The Journal of Commerce estimates in a recent issue that stocks in America have increased 26,000 tons since January 1, making a total stock of 80,000 tons on Oct. 1. But other reports show a material decrease during the past nine months, and based on the actions of the market our opinion is that the latter is more apt to be correct. The statistical position of this metal must always remain purely a matter of opinion until such a time as the copper producers resume their former policy of announcing their monthly output, with an annual or semi-annual statement of stocks on hand.

Messrs. H. A. Watson & Co., of Liverpool, report as follows:

"Intrinsically there is no change in the position of the metal; although consumers are naturally holding off the market for the present, trade generally continues to be good, and with the more important producers showing no inclination to reduce their limit, prices for refined copper have been well maintained.

"There is still a lack of confirmation of the report, of which so much has been made, that China is anxious to re-sell some of her recent purchases. It is quite possible that holders were tempted, when prices were at a high figure, to take a profit on copper not immediately needed, with the intention of replenishing their stocks later. It would appear, however, that the recent break has altered the position; in any case none of this copper is now apparently available.

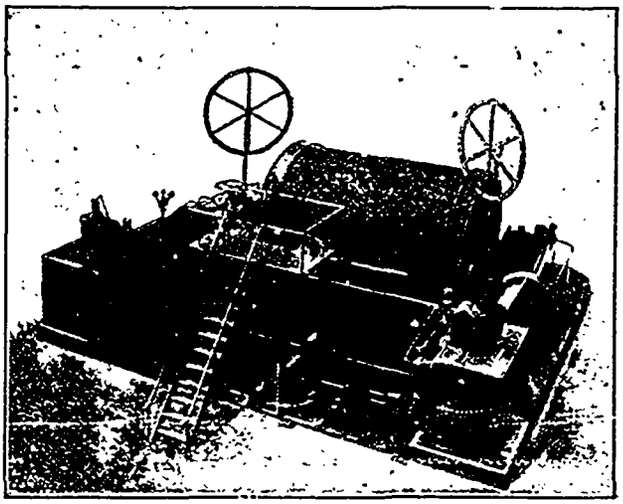
INDUSTRIAL AND MACHINERY NOTES.

The Imperial Steel & Wire Company, of Collingwood, Ontario, contemplate erecting important additions to their factory at that place, the cost of which will not be less than $100,000.

The De La Vergne Machine Company, East 138th Street, New York, send us a new catalogue, descriptive of the Koerting Four Cycle Gas Engine. This engine has been in commercial use since 1879, but has undergone numerous important improvements and is regarded to-day as a highly economical and efficient engine.

One important use for compressed air is in the operation of quarries. Messrs. Kelly Bros., of Winnipeg, have just purchased from Allis-Chalmers-Bullock, Limited, Montreal, six Haeseler Pneumatic Hammers for dressing stone. These will be operated by an Ingersoll-Sergeant Sir Compressor, Class "E," driven by a twenty-five H.P. induction motor.

The Calumet & Arizona Mining Co., of Bisbee, Ariz., is installing a Sullivan Corliss Cross-Compound steam two-stage air compressor, with a total piston displacement of 3,660 cu. ft., which, on account of the altitude at which the compressor operates is equivalent to an actual delivered capacity of 2,700 cu .ft. of free air per minute, against a terminal pressure of 100 pounds per sq. in., while running at 83 H.P.M. This machine is expected to attain a very high efficiency, being designed to run condensing, and to operate when carrying its most economical load on 15.2 pounds dry steam per 1 H.P. per hour. The steam cylinders are seventeen inches and thirty-four inches, and air cylinders twenty inches and thirty-four inches in diameter, with a common stroke of forty-two inches. Rolling inlet valves controlled by independent eccentrics are used on



both the high and low pressure air cylinders. Rolling discharge valves are also used on the low pressure air cylinder. In addition to these, a number of automatic poppet discharge valves are used on the same cylinder. The high pressure air cylinder is equipped with a full set of removable automatic poppet discharge valves, which act in a direction parallel with the steam piston rod. An interesting feature is the automatic oiling system, which lubricates all the working parts regularly and without the attention of the engineer. The machine will be used for operating rock drills and other pneumatic tools about the mines. The company already has 3 class WB-2 Sullivan straight-line compressors, giving a total air supply of about 5,700 cu. ft. per minute.

The Demand for Mechanical Stokers.—That the mechanical stoker has reached such a state of perfection as to be considered indispensable in the equipment of modern boiler plants is indicated by the large number of orders booked by the Westinghouse Machine Company for the Roney stoker, a type of their exclusive manufacture. During the past ten years this company has developed the Roney stoker by successive improvements until it has become capable of meeting successfully all the requirements of heavy modern service. During the past month orders have been received for no less than 51 Roney mechanical stokers, ranging in size from 54 inches x 20 grate to 132 inches x 26 grate, the largest of the orders being that of the Pennsylvania Railroad for six 132 inches x 26 grate stokers and five 100 inches x 20 grate stokers. A large order from the Ohio Hospital for Epileptics at Gallipolis, Ohio, has also been received and others from the American Bridge Company, Ambridge, Pa., National Tube Company, Pittsburg, Pa., Detroit United Railway Company, Detroit, Mich.; York Engineering Company, York, Pa., Proctor & Gamble Company, Cincinnati, Ohio; The Union Rolling Company, Cleveland, Ohio, Gulfport and Mississippi Coast Traction Company, Gulfport, Miss.; United Presbyterian Board of Publication, Pittsburg, Pa.; Indiana Boys' School, Plainfield, Ind., B. & O. Office Building at New York City and the Railway Exchange Building at Chicago, Ill.